DEMONSTRATION IN FOLLOW UP:
EPSDT
Pierce County, Washington

2.

First Evaluation Report
(June 1977-April 1978)

Information
Resource
Center

EPSDT 6.29

Prepared by:
Health Services Research Institute
The University of Texas Health Science Center
at San Antonio

REPORTS
RJ
102
.5
W2
U55
1978

RJ
102.5
.W2
U55
1978

FIRST EVALUATION REPORT

(June 1977 - April 1978)

"DEMONSTRATION IN FOLLOW-UP: EPSDT"

PIERCE COUNTY, WASHINGTON

Health Services Research Institute
The University of Texas Health Science Center at San Antonio
7703 Floyd Curl Drive
San Antonio, Texas 78284

Consultant Staff

Harry W. Martin, Ph.D.
Director, HSRI

Harold Dickson, Ph.D.
Deputy Director, HSRI

Evaluation Staff

Arthur E. Britt, M.A.

Wayne Stinson, Ph.D.
Primary Evaluator

Janice Pape, B.S.

Pat Toy, M.S.W.
On-Site Coordinator

Data System Support

Carol Ellis, B.A.

Nancy Karam, M.S.

Rose Connors

State Project Officer

Eileen Keith, M.P.H.

Project Director

Rebecca Curneen, C.H.N.

Pierce County Coordination

Walter Herron, M.D., M.P.H.
Director
Pierce County Dept. of Health

Nancy Cherry, R.N., M.S.
Director of Nursing
Pierce County

Supported by HCFA Grant No. 11-P-90361/0-01 to the State of Washington Department of Social and Health Services and Evaluation Contract (1993-AGF-12950 (1) and (2)) between the State of Washington Department of Social and Health Services and The University of Texas Health Science Center at San Antonio.

TABLE OF CONTENTS

	Page
PREFACE	i
SUMMARY	ii
LIST OF TABLES	v
LIST OF EXHIBITS	vii
CHAPTER ONE: PROJECT BACKGROUND AND OBJECTIVES	I-1
- Project Chronology	I-2
- Research Hypotheses	I-3
CHAPTER TWO: PROJECT DATA SHEETS	II-1
- Consent Form	II-1
- Screening Form	II-1
- Medical Referral Form	II-2
- A Critique of Project Data Forms	II-3
CHAPTER THREE: PROVIDER AND CLIENT CHARACTERISTICS	III-1
- Single Site Versus Multiple Site Screens	III-2
- Numbers of Screens	III-2
- Client Characteristics	III-3
- Case Finding in Pierce County	III-4
- Summary	III-5
CHAPTER FOUR: PROBLEMS FOUND AT SCREENING	IV-1
- Problem Finding Rates	IV-1
- Types of Problems Found	IV-2
- Some Conclusions and Comparisons	IV-3
- Some Possible Explanations	IV-3
- - Age Distribution	IV-3
- - Motivation for Visit	IV-5
- Conclusions	IV-8
CHAPTER FIVE: THE TREATMENT AND REFERRAL OF PROBLEMS	V-1
- Treatment and Referral in the Experimental Group	V-1
- Differences between the Control and Experimental Groups	V-1
- To Whom Referred	V-2
- Immunization Status	V-3
- Summary	V-3

TABLE OF CONTENTS
(Continued)

	Page
CHAPTER SIX: THE CASE MONITORING SUBSYSTEM	VI-1
A. Screen Completions	VI-2
B. Infant Rescreens	VI-2
C. Treatment Follow-up	VI-7
- Interval to First Treatment	VI-9
- Interval to First Treatment, Including Problems Treated at Screen	VI-12
- Interval to Problem Closure	VI-12
- Closure Status	VI-12
- Problem Resolutions	VI-17
- Case Conversions/Completions	VI-19
- Case Retentions	VI-19
- Treatment Outcomes	VI-19
- Untreated Problems	VI-21
- Project Transportation	VI-21
D. Case Monitoring Costs	VI-23
E. Summary	VI-23
CHAPTER SEVEN: SUMMARY OF MAJOR FINDINGS	VII-1
- Overview	VII-1
- Project Background and Objectives	VII-1
- Provider and Client Characteristics	VII-3
- Provider Characteristics	VII-3
- Number of Screens	VII-4
- Client Characteristics	VII-4
- Problems Found at Screening	VII-5
- Data	VII-5
- Some Conclusions and Comparisons	VII-5
- The Treatment and Referral of Problems	VII-6
- The Case Monitoring Subsystem	VII-7
EXHIBITS	
APPENDIX TABLES	

Preface

This project was approved by the Social and Rehabilitation Service,[*] DHEW, effective December 1, 1976.

The period December 1, 1976 to May 31, 1977 was devoted to "start-up" activities, e.g., hiring and training of personnel, and organization and acquisition of space, development and acquisition of forms, recruitment of participating health practitioners, etc.

The period June 1, 1977 to April 30, 1978 is part of the total operational phase of this project. This is the phase covered by this report. The initial operational activity, June 1, 1977 to approximately September 1-15, 1977, was the collection of the main body baseline data for data comparison purposes with the demonstration activities. The subsequent period, generally September 1-15, to April 30, 1978 was devoted to testing the results of implementing the new case monitoring system.

---

[*] Subsequently redesignated the Health Care Finance Administration.

SUMMARY

This is an interim report on the Pierce County (Washington) EPSDT demonstration project, covering the period June 1977 through approximately April 30, 1978. It is the first interim report, and has been scheduled so as to include preliminary tests of several experimental hypotheses. This report was prepared by the Health Services Research Institute of San Antonio, under Contract Number 1993-AGF-12950(2) with the Washington State Department of Social and Health Services.

The major thrust of this project has been to "demonstrate the effectiveness of a follow-up system in assuring that children found to have problems during screening receive diagnosis and treatment."

The project is most effectively accomplishing this objective. It has developed a follow-up (case monitoring) system from identification of eligibles screened, to treatment and treatment completion, including forms, client/provider feedback, full-time case monitors, and a supporting data processing component to include periodic case management rosters of incomplete actions and rescreen scheduling.

It has now "piloted" this model for a period of approximately ten months (August 1977 to June 1978), and, as a consequence, has learned of modifications prerequisite to promulgating a model for possible statewide utilization. Some of these modifications are proposed for testing in the follow-up project year (1978-1979).

Additionally, the development of a proposed "operational Handbook" by the project for the conduct of the EPSDT program in the State of Washington is now in progress.

Details of the supporting test hypotheses are included in the body of this report. Preliminary data strongly support all of the hypotheses regarding treatment completion, but they have been less conclusive on rescreen scheduling and health status. The project only expected to affect treatment of problems requiring more than one visit, and its impact on treatment success and shows for treatment for these problems has been dramatic. In the control group, 37.0 percent of cases were converted from unwell to well, compared to 70.1 percent in the experimental group. In the control group, 41.9 percent of referred problems were resolved (that is, fully treated) compared to 76.2 percent in the experimental group. The control group lost 43.0 percent of its clients because of refusals, missed appointments, or loss to follow-up, compared to only 15.4 percent in the experimental group. These findings are only preliminary, and they refer only to problems not fully treated at first visit, but they are of considerable significance to EPSDT in Washington State and elsewhere.

Case monitoring has so far not increased the ratio between actual and expected infant rescreens, but we expect this ratio to improve in the coming months. The state recommends rescreens at frequent intervals, and we have found

that a computerized management system is not feasible because of the quick turn around required. Results should improve because the project has now instituted a manual tickler system.

The project's case monitoring costs have been $29.07 per problem followed and $48.10 per case. These estimates do not include the cost of screening and treatment, but a study of Medicaid billing profiles is now under way and will obtain this information. Monitoring costs have been quite reasonable so far, and they may decrease further because of a shift to geographic assignment of community health workers.

One final finding relates to physician cooperation with data collection and evaluation. Although the project pays providers $3.00 per screening sheet, several have dropped out of the project and several others have required a project nurse to abstract data from patient records. Many providers appear willing to assist the project, but they lack the internal management systems and staff to handle additional paperwork. This finding extends beyond EPSDT and should be considered in planning for other national health programs.

Care must be taken in comparing data from Pierce County with data generated elsewhere because of several unusual features. The screening, diagnosis and treatment system in Pierce County largely follows the private sector screening/treatment model of Ohio and Pennsylvania rather than the public sector screening/private sector treatment approach of Texas and Michigan. Private physicians have provided more than three-fourths of all screens, and, to date, 77.9 percent of problems have received at least some treatment during the screening visit. Of those that have not been treated during the first visit, nearly half have been referred back to self rather than to a new provider. Based on rather limited data, we estimate that about three-fourths of all problems have been fully treated by a single provider, while about one-fourth have involved an outside referral. The former should generally require less case monitoring because both the provider and the location are familiar.

Problem finding rates have been exceptionally high in Pierce County for such acute episodic conditions as respiratory infections and skin problems, but they have been unusually low for hearing, dental, and vision problems. The skewing of data in this direction could be anticipated if there is not an aggressive outreach activity inputting apparently well children into the system for assessment to counterbalance those coming into the program because of a sick episode. These data also suggest that a full screen (assessment) including dental, hearing, and vision examination and testing may not be accomplished in many cases when the causative factor of the child entering the screening is an "acute" condition. Evaluation in the coming six months should include discussion with various categories of providers on the question of acute/preventive emphasis for EPSDT in the one step mode.

Finally, we note the skewed age distribution of clients in Pierce County and recommend that all comparisons with other programs be controlled for age. In Pierce County, 78.1 percent of screens have been on children aged six or younger compared to 45 percent nationally. The proportion is high, of course, partly because of the number of infant rescreens; but when only initial screens are counted, the proportion is still 71.8 percent. The Tacoma-Pierce County Health Department and private physicians have had a strong well-baby program for some time, and it appears that some of this activity may have been converted to EPSDT. This possibility merits continued study. These caveats do not weaken the validity of project findings, but they do suggest caution in generalization.

We reiterate that the project is accomplishing its major objectives and will be ready for further refinements next year. While certain conclusions must be further tested with additional data, we expect the major findings to be fairly stable by the end of 1978. The project has a commendable commitment to quality research, and has developed an excellent balance between research constraints and the need to provide services.

LIST OF TABLES

Text Tables

Page

IV-1: Proportion of Screens with Dental, Hearing, and Vision Problems: Children under Seven, First Quarter, 1977 IV-4

IV-2: Percent of Screens with Problems and Mean Number of Problems per Screen, by Age and Provider Type IV-6

VI-1: Percent of Screens Completed VI-3

VI-2: Screens not Completed at First Visit VI-4

VI-3: Numbers of Infant Screens and Rescreens, by Timing Status VI-6

VI-4: Ratio of Expected and Actual Infant Rescreens, by Timing Status VI-8

VI-5: Interval between Screen and First Treatment for Problems not Treated at Screen VI-11

VI-6: Interval between Screen and First Treatment, Including Problems Treated at Screen VI-13

VI-7: Proportion of Referred Problems Closed, by Interval Since Screen (Experimental Problems Only) VI-14

VI-8: Problem Closure Statuses for Referred Problems VI-16

VI-9: Proportion of Problems Resolved VI-18

VI-10: Proportion of Cases Converted and Proportion of Clients Retained (Cases with at least One Referral Only) VI-20

VI-11: Distribution of Untreated Problems VI-22

Appendix Tables

A-1: Number of Screens, by Provider

A-2: Distribution of Screens, by Month

A-3: Comparison of Project Screens with County and State Totals

A-4: Distribution of Total and Initial Screens, by Age at Screening and Provider Type

A-5: Distribution of Screens, by Provider Type and Ethnicity

A-6: Distribution of Screens, by Patient's Zip Code

LIST OF TABLES
(continued)

Appendix Tables (continued)

A-7: Percent of Screens Reporting Abnormal Conditions

A-8: Percent of Screens Having Problems in Various ICDA Groups

A-9: Percent of Certain Screens Reporting Abnormal Conditions, by Provider Type

A-10: Problem Disposition

A-11: To Whom Referred (Control Group only)

A-12: Immunization Status, Before and After Screen

A-13: Distribution of Referred Problems and Cases, by Various Characteristics

LIST OF EXHIBITS

1. Project consent form
2. Screening form
3. Medical referral form
4. Form letter for diagnosis and treatment providers other than screener
5. Detailed case closure statuses
6. ICDA Groupings
7. Case monitoring procedures
8. Grouping of problem completion statuses

CHAPTER ONE

PROJECT BACKGROUND AND OBJECTIVES

The Washington State Department of Social and Health Services (DSHS) began discussion of a special EPSDT project late in 1974, at a time when the need for a statewide EPSDT program was becoming increasingly evident. The project was intended both to lay the groundwork for such a statewide program and to test certain modes of case monitoring that would be of interest to other states as well. The project has adhered closely to these broad objectives in the three to four ensuing years, and considerable progress has been made in achieving them.

As stated in the original grant application:

> The primary purposes of this project will be to collect program and cost information relative to the existing EPSDT program and to examine the impact of introducing an innovative case monitoring and follow-up model. The innovative model will take the form of full-time Community Health Workers with the assigned responsibility of ensuring the continued participation of children who have been screened, i.e., keeping appointments for diagnosis and treatment, showing for rescreening at periodic intervals, etc. Enhancing existing screening provider efforts at following-up of screened children, this model will include frequent telephone and personal contacts with parents of the children, and offers of transportation when necessary. Specifically, the objectives are:
>
> 1. To introduce an aggressive follow-up program from point of screening that will maximize the number of children brought through prescribed diagnosis and treatment to a point of problem resolution;
>
> 2. To implement a reporting system that will provide information about the types of problems identified, diagnoses made, treatment prescribed, problems resolved and costs for diagnosis and treatment;
>
> 3. To determine the most cost effective procedure for case monitoring and follow-up, comparing existing and innovative models.

Case finding was specifically excluded from the project design, both because it was already being thoroughly tested elsewhere* and because the state felt that case monitoring was the more essential activity. The forms that were developed and the data that have resulted pertain specifically to a program without case finding, and adaptations would be necessary were this element to be added.

---

*HSRI, Final Evaluation Report - Phase IV. EPSDT in an Urban Setting--Dallas, Texas, September 15, 1978.

This project, in brief, sought to help the state decide whether to adopt a statewide EPSDT plan and to test data forms and procedures to be used if such a plan were to be adopted. The cost of EPSDT, in both its existing and innovative modes, was expected to be a major consideration, and this cost study is currently in progress.

The Health Services Research Institute (HSRI) became involved in this project early in 1975 and was selected as the evaluation contractor in 1976 on a sole source basis. The project design reflected the Institute's experiences with EPSDT across the country and made considerable use of concepts and evaluation models that HSRI had developed and tested elsewhere. This report will not attempt to evaluate EPSDT as a programmatic concept, but will broadly review the apparent effectiveness and efficiency of the particular delivery modes developed in Pierce County.

Project Chronology

The most detailed sources of project history are the periodic reports submitted by project staff to DHEW and by HSRI to the project. The following chronology lists only the most important events affecting this evaluation.

1974 - Early state discussions of project objectives; initial contacts with DHEW.

1975 - DSHS asks HSRI to comment on project ideas and to assist in proposal development; Dr. Harold Dickson and Art Britt make three site visits at Institute expense to provide consulting services.

March
1976 - DSHS submits formal proposal to DHEW.

November
1976 - DHEW approves proposal for initiation December 1, 1976.

December
1976 - Project begins.

January
1977 - Mr. Britt makes site visit; Institute hires Howard Crockett as on-site data coordinator. Job descriptions developed.

February
1977 - Three Institute staff members (Britt, Ligon, and McGill) visit Pierce County to discuss proposed data forms.

March and April
1977 - Meeting with Pediatric Society. Project data forms developed.

May
1977 - Data forms pretested and printed. Providers sign contracts for project participation.

June
1977 - Provider and office staffs trained. Control phase of project begins.

July
1977 - Elaine Schlessinger replaced by Becky Curneen as project director. Project hires and trains community health workers (CHW's). Britt and Dr. Kramm visit project.

September
1977 - Providers recontacted and trained for experimental system. Experimental case monitoring begins.

October
1977 - Edith Hairstrom (SRS) visits project.

November
1977 - Ms. Keith and Ms. Curneen visit Institute in San Antonio. Howard Crockett resigns as on-site coordinator.

December
1977 - Britt, Stinson, and Barbas visit project and hire Pat Toy as the new on-site coordinator. Institute issues first management rosters. Project recontacts all providers. Drs. Padgett and Mulligan enter project.

January
1978 - HSRI completes initial data entry.

February
1978 - Pat Toy spends one week in San Antonio assisting data entry and doing initial analyses. Project begins control group follow-up using a single CHW. One CHW resigns, leaving two for routine case monitoring. Wayne Stinson visits Tacoma.

March, April
1978 - Project hires Adrienne Alexander as planner; develops and writes up proposed 1978-79 sub-studies. Control group follow-up continues. Stinson and Britt discuss sub-studies during site visit.

May
1978 - Project continues work on sub-studies and submits concept paper to DHEW. Control group follow-up largely completed. Geographic assignment of case workers begins. Drs. Secaur, Walkley and Wearn drop out of project.

Research Hypotheses

Although this was intended primarily as a pilot demonstration project, a number of formal research hypotheses were set forth for testing. These are listed here for reference and will be thoroughly discussed in Chapter VI.

1. Case Monitoring Subsystem

    a. The model case monitoring system will have a higher rate of screen completions per number of shows for screening.

    b. The model case monitoring system will have a higher rate of rescreen completions per number of eligibles for rescreening.

    c. The model case monitoring system will have a higher retention rate, that is, fewer eligibles lost to the program.

    d. The model case monitoring system will have a higher rate of problem resolutions per number of confirmed problems.

    e. The model case monitoring system will have a higher rate of case completions per number of confirmed unwell cases.

    f. The model case monitoring system will have a greater proportion of clients receiving treatment within time limits prescribed by federal regulations (60 days).

2. Treatment Outcomes

    a. Clients served by the model case monitoring system will show greater improvement in health status, as measured by general healthiness ratings, and by severity ratings of specific problem conditions.

    b. Clients served by the model case monitoring system will show greater "preventive" healthiness, as reflected by the currency of their immunization status, and assessments of their dental health.

    c. Clients served by the model case monitoring system will show a higher rate of case conversions, that is, unwell to well cases.

The current report tests six of these hypotheses using data collected through April 1978, and it offers further discussion on the remaining three. Hypothesis 1a was not tested because the control group had such a high proportion of complete screens that statistical improvement could not be expected. The two hypotheses related to healthiness ratings (2a and 2b) were intended to apply to annual rescreens, and there have been too few of these so far to evaluate. All hypotheses will be further tested in a later report.

CHAPTER TWO

PROJECT DATA SHEETS

The Pierce County EPSDT project has developed and tested both a screening data sheet and a data sheet for medical referrals. Local pediatricians actively helped the TPCHD project to develop and pre-test these forms, and the Health Services Research Institute contributed ideas gained from experience elsewhere. The forms had to meet both the special research needs of the project and the requirements of routine case management, and some data elements were not expected to be needed for a statewide activity. This chapter discusses the content of these forms and the procedures for filling them out, and it concludes with a discussion of possible revisions.

Consent Form

At the time each child receives his or her first EPSDT screen, the screener's office staff briefly describes the research project to the parent or guardian and requests the latter's consent to enroll the child. The parent is told that the child will be given complete medical services regardless of whether or not she or he participates. If consent is given, the parent signs the appended form (Exhibit 1), and the office retains this for forwarding to the project. Unsigned forms are also sent to the project and retained. The proportion who refuse consent appears to depend partly on the screener's office staff, but we are unable to evaluate this by direct observation.

Screening Form

The screening form shown as Exhibit 2 is completed by the screener for each screen, whether or not all recommended tests are done. It comes in two essentially identical versions, one for the control group and the other for the experimental; these forms differ only in color. The screener or his staff may complete this form either during or after the screen. The project reports that office staff (rather than the screener) usually fill them out from patient records some time after the screen is actually done. The project pays the provider $3.00 for each completed screening sheet, but reportedly only one physician passes this on to the nurse or clerk responsible for form completion. One major provider has declined to fill out the forms, so a project nurse does it herself weekly in the physician's office.

Forms 1 and 2 have two sections in which the provider may note problems found. Section F classifies findings into 29 categories. These categories are not mutually exclusive, however, so a single symptom may be reported two or even three times. Conditions classified under Step 1 ("Ht./Wt./Age"), for example, are very often reported under Step 29 ("Nutritional") as well. Similar overlaps occur in Steps 21 through 25, and in steps referring to ear and eye conditions.

Section F allows us to analyze the conditions which screeners have found to be abnormal, but it does not provide a problem count.

Section G does provide an unduplicated count, however, and it also requires labelling of problems by ICDA. Section G provides space for up to five separate problems, and this has proven to be sufficient in all but a very few cases.

Section I of the screening sheet indicates the individual primarily responsible for the physical examination. To-date, 85.1 percent of screens have been signed by a physician, 12.0 percent by a pediatric nurse practitioner (PNP), and 2.9 percent by someone else (generally the single osteopath provider).

The provider keeps the first copy of the screening sheet and delivers two to the project. The project in turn retains one copy and forwards the final one to HSRI.

A few of the data elements shown on the screening sheet are not available for computer analysis since they were intended only for case management. Family name, phone number, and child's address do not appear on the Institute's copy, although the zip code does. Section C, "Vital Signs and Measurements", is also blacked out on the Institute's copy. Section H, "Comments", and the part of Section I dealing with the reasons for incomplete screening have also not been entered on the computer although they are available for hand analysis.

Medical Referral Form

A third data sheet, the medical referral form (Exhibit 3), is completed for all experimental screens in which problems were found. Since Form 3 allows for only three problems, a second sheet (with a different form number) must occasionally (3.3 percent of screens) be used for a single screen. Form 3 should normally be initiated by the provider at the same time as the screening sheet, but some forms reach the project only partially filled out. A project nurse checks and completes any partial forms. The project makes no additional payments beyond the $3.00 paid for the screening sheet. The provider keeps one copy of the medical referral sheet, the project keeps one, and two are sent to the Institute (see below).

Form 3 is divided into four sections, and for some problems, these may be filled out at three distinct times. The top section identifies the child and establishes linkage with a screening sheet. The screener section identifies each problem by ICDA, indicates any previous knowledge about the condition, and notes whether the problem is being treated and/or referred. Referrals may be made to self (for a second visit), to other providers participating in the project, or to persons or institutions with whom the project has not established routine relationships. We have recently begun to code the type of provider to whom patients have been referred and this datum will be fully available for a later report. The top two sections essentially repeat information from the screening sheet, since only the subsection on previous knowledge is new.

The abbreviated green copy of the medical referral sheet is sent to the Institute at the same time as the screening sheet. This copy includes only the top two sections and enables the Institute to establish a problem file and a list of incomplete actions. The file is considered open until case monitoring has been completed and the second HSRI medical referral copy (blue) has been entered. The Institute sends the project a monthly roster of incomplete actions for all problems still open 180 days after the screening date.

The problem classification section is filled out at various times depending on the type of problem. If the screener treats the problem during the screen (77.9 percent of problems so far), this section is filled out then. If the problem is later found to be a false positive, project staff will adjust the middle section accordingly. If the problem is first treated after the screen, the problem classification section is filled out at some appropriate time later on; information in this section may then refer to the first treatment visit, or it may come from a later visit. If the screener refers the problem to another provider without treating it, the project sends a form letter (Exhibit 4) to the new provider asking for information; this is subsequently copied onto Form 3. (No fee is paid for this form). The problem classification section was primarily intended for case management.

The bottom section of Form 3 is filled out after the case monitor has completed all of her work on a particular problem and indicates the problem status as of that time. (See the section on case monitoring for additional information). This is then sent to the Institute for case closure.

A Critique of Project Data Forms

The forms used in this project were developed jointly by the Pierce County demonstration project, consulting providers, and HSRI, and they were intended both for research and for routine case management. They had to cover both one- and two-step screens, that is, screens in which the screener and the treater were the same, and those in which they were different individuals. They were not expected to be recommended without revision for eventual statewide adoption. Although not ideal from any single point of view, they were expected to satisfy basic data requirements. These initial expectations have proven to be largely correct.

The TPCHD project was primarily intended to test case monitoring functions, and these have included:

- follow-up for treatment of problems found at screening
- the arrangement of annual and infant rescreens
- screen completion for missing tests.

The data system was primarily designed for the first of these functions and has proven to be somewhat inadequate for the other two.

The project reports that providers have praised the screening form for its attractiveness and simplicity and that they have generally found it easy to fill out. The medical referral form has been less easy to use and has required extra clerical work by a project nurse. The latter form describes only the beginning and the end of each problem and tells us rather little about the process of case monitoring and treatment. The project plans to abstract a sample of case worker records to develop additional data on monitoring processes. A more detailed critique of these forms will be discussed when they are adopted for use outside Pierce County. This critique will consider:

- adequacy for routine case management
- adequacy for evaluation and planning
- degree of duplication; volume of paperwork generated
- accuracy of information obtained.

The points of view of all major users will be solicited throughout the next year.

CHAPTER THREE

PROVIDER AND CLIENT CHARACTERISTICS

During the first year of the demonstration project, a total of 27 physicians and clinics have provided EPSDT screens and have signed contracts to complete data forms and cooperate with case monitoring. Screeners have fallen into three broad types: private physicians (including one osteopath), publicly-funded community clinics, and the Tacoma-Pierce County Health Department (TPCHD). Screens have actually been performed in approximately 35 to 40 different locations as described below.

A total of 23 physicians have participated in the project. All but five of these are pediatricians, the remainder being in family or general practice. About 75 percent of the pediatricians in Pierce County are enrolled in the project. A number of the project physicians practice together, leaving 17 different physician offices. Most of these are in Tacoma, with three in Puyallup and one in Eatonville. Physician participation has been relatively stable; two new physicians joined the project in December and January, and one group of three (Drs. Secaur, Walkley, and Wearn) dropped out in May 1978 when one of their number moved to King County. Two physicians at Sound Health (a health maintenance organization) joined the project but never became active due to a very low number of EPSDT screens. The stability of physician cooperation has been at least partly due to continuous and careful monitoring by the project director.

Three community clinics have participated, but by far the largest provider in this group has been the Hilltop Community Maternal/Child Services. This clinic is primarily funded through the WIC (Women, Infants and Children) program, and its personnel are particularly well-trained in nutrition. A physician is often present, and we will see shortly (Chapter Five) that most problems found there through EPSDT are treated on-site. The other two community clinics are Key Peninsula and Eastside.*

The third provider is the Tacoma-Pierce County Health Department. TPCHD operates periodic adolescent health and well-child clinics at seventeen locations throughout the county. As their name implies, they are primarily preventive in orientation, and they do little treatment on-site. Most of their clients come from the near poverty group--those who are too poor to pay for discretionary health care, but not eligible for Medicaid. The number of EPSDT screens performed has generally averaged about two per session. Nurses and volunteers do much of the screening work at these clinics, but a retired physician has often been available.

---

*Dr. Tanbara works both as a private provider and as the sole physician/screener at the Eastside Clinic. Since he uses the same provider number at both locations, we have had to count all of his screens in the community clinic group. Screens at these two locations will be separately identified for the next report.

Single Site versus Multiple Site Screens

Screeners in Pierce County may also be distinguished by whether they offer one-step or two-step EPSDT. Screens performed by physicians are generally considered one-step screens because physicians are able to treat most problems without referral elsewhere; nurses and volunteers who do most two-step screens must refer problems to a new provider for diagnosis and treatment. Most (88 percent) of screens in the Pierce County project have been done by a physician, and only TPCHD fits clearly into the two-step model.

There is another probable difference between one-step and two-step screens that needs to be considered in statistical comparisons. Two-step screeners offer a primarily preventive health service, since children with known problems are more likely to go directly to a doctor (assuming they have one) than to a well-child clinic. Physicians see both well children and those with known health problems, and it is likely that a higher proportion of their EPSDT clients are either currently or recently sick. Some physicians, as we will see in Chapter Four, screen children during sick visits, while others schedule a separate EPSDT screen at a later time. Those who screen during sick visits will have high problem "finding" rates simply because of the timing of the screen. The chart below summarizes some of these differences:

	One-Step	Two-Step
Type of Screener	Usually a physician	Usually nurses and volunteers
Location of Treatment	Usually at screening site	Usually referred elsewhere
Motivation for Screen	Usually in conjunction with sick visit	Usually preventive

The tables discussed below do not directly compare one- and two-step screens, however, because there are too few cases in the latter group for reliable conclusions.

Numbers of Screens

Appendix Table A-1 shows that 10 of the project's 27 screeners have each performed more than 100 screens, while 17 have performed fewer. Almost half of the project's 3,288 screens (both control and experimental groups) have been done by Drs. Origines, Jolley, and McGroarty and by the Hilltop Clinic. Approximately 7.6 percent of screens were done by the Tacoma-Pierce County Health Department's well-child clinics, while 7.0 percent were provided by Drs. Secaur, Walkley, and Wearn. (These three physicians recently dropped out of the project). The top 10 providers did 85.6 percent of the screens.

Initial discussions about the project classified providers into five groups, and these are also shown in Table A-1. The high volume group includes Drs. Origines, Jolley, McGroarty, Coyner, and Sparling, while all other physicians are classified as low volume. (These groupings were defined before the project began, but they have proven to be correct). High volume physicians have performed 47.5 percent of screens, the low volume group 29.9 percent, community clinics 14.8 percent, and TPCHD 7.6 percent. The HMO has reported only five screens and will be ignored in subsequent discussions by provider group.

During the period covered by this report, project personnel collected data on 3,288 screens, and 2,548 different individuals. The number of screens has averaged 296 per month, of which 229 have been initial screens, and 67 rescreens. Appendix Table A-2 shows that the numbers of total and initial screens have fallen rather steadily since peaking in July 1977; the mean numbers per month have been nearly 100 lower in 1978 than they were in 1977. The decline has mostly occurred among children aged six and younger (including infants), and it may be at least partly a seasonal effect of school schedules. High volume providers have averaged 141 screens per month, low volume providers 88, community clinics 44, and the TPCHD well-child clinics 21. Table A-2 also distributes screens by whether the patient was in the control or experimental group.

During the first six months of the project (June through November), 33.2 percent of the screens in Pierce County and 9.0 percent of those in the State were reported to the project. (See Table A-3). Pierce County as a whole reported 27.2 percent of all the screens done in Washington State during this time period.

Client Characteristics

Table A-4 shows that 40.8 percent of screens to date have been on children under one and that 78.1 percent have been on those six or younger. While this age distribution is, of course, perfectly legitimate, it does appear skewed in comparison both with the probable distribution of eligibles and with the age distribution of screens for the United States as a whole. U.S. data show that 39.5 percent of eligibles and 45 percent of those screened have been six or younger.* The Pierce County figures are slightly inflated by infant rescreens, but even when only initial visits are counted, we still find that 71.8 percent of clients have been under seven.

Table A-4 also shows that the case loads of physicians (both high and low volume providers) have tended to be much more concentrated below age one than have those of community and TPCHD clinics; for the latter two groups, preschoolers have been the predominant age category. This may affect certain comparisons between provider types although it does not appear to be a major interpretational constraint.

---

*HCFA, unpublished data.

Appendix Table A-5 shows that 69.7 percent of those screened have been White and 20.2 percent Black. The percentage White has ranged from 52.6 percent for community clinics to 78.6 percent for TPCHD. About 52.4 percent of those screened have been boys and 47.6 percent girls.

Patients screened in the Pierce County project have reported addresses (zip codes) from virtually all over western Washington, including points as far away as Port Angeles, Hoquian, and Longview. The vast majority (98.0 percent), however, have reported zip codes inside Pierce County, and most of these appear to be inside the city of Tacoma and nearby unincorporated areas (zip codes between 98401 and 98499). The ten most frequently reported zip codes are listed in Table A-6, along with other details. The chief reporting areas are all inside Tacoma, except for 98371 which is in Puyallup. Table A-6 shows that altogether 81.8 percent of screens have been on Tacoma residents, and 16.9 percent have been on county residents living outside the city. These distributions appear to accord fairly well with the distribution of population in the county, as recorded in the 1970 census.

Case Finding in Pierce County

In February 1977, statistics* showed 14,881 children in Pierce County who were eligible for Medicaid and, hence, for EPSDT. Assuming an annual turnover rate of 30 percent, we can estimate that 19,345 children have been eligible during the first year of the project. During the first eleven months, the project screened 2,548 of these, for an estimated annual penetration rate of 14.4 percent. If we count screens done outside the project, the penetration rate becomes approximately 43.1 percent.

The skewed age distribution of project screens may be at least partly due to the absence of aggressive case finding (see Chapter Two). Direct case finding in Pierce County consists of routine letters and notices with welfare checks, and this has been found elsewhere to have had little effect.** It is reported, however, that local physicians and providers strongly encourage prenatal and well-baby visits for mothers of all income groups, and this effort probably assists EPSDT. Once in the system, infants are likely to remain there because of the project's rescreen monitoring. These factors favor the inclusion of infants and may explain the skewed age distribution.

It has also been suggested that the favorable reimbursement rates for EPSDT may also act as a sort of case finding device. Prior to mid-1977, physician office visits and EPSDT screens were both reimbursed at $13.54, but then EPSDT was raised to $20.31. (Both rates exclude the cost of specific tests, and these may raise costs ten to fifteen dollars per screen). Providers previously had little incentive to distinguish EPSDT from other well-child or preventive health visits, but they may be more likely to do so now that billing rates are different. (There is no quantifiable evidence that this has occurred, however).

---

*HEW publication No. (SSA) FF-11921, August 1977.

**HSRI, Final Evaluation Report - Phase IV. EPSDT in an Urban Setting - Dallas, Texas, September 15, 1978.

Summary

The Pierce County project has so far screened 2,548 children, through 27 providers operating in 35 to 40 different locations. Thirty percent of those screened have been infants and, because of the frequent rescreening, 40.8 percent of all screens have been to babies under one. About 77.4 percent of screens have been done by private physicians, and four providers (including one community clinic) have done half of all screens. Most providers combine screening and treatment in one location; the number of problems referred to someone other than the screener has been relatively small.

Comparison with county and state figures shows that during the first six months, the project did 33.2 percent of all screens in the county and 9.0 percent of those in the state. Slightly more than a quarter (27.2 percent) of all screens done in Washington during this time were done in Pierce County. The project appears to be screening 14.4 percent of county eligibles, while the county as a whole is reaching 43.1 percent.

CHAPTER FOUR

PROBLEMS FOUND AT SCREENING

Chapter Four analyses the types and rate of problems that are being found through the Pierce County EPSDT project. These discussions (and those in Chapter Five) are essentially preludes to our later discussion of case monitoring. Although case monitoring should not influence the type and volume of problems being found, clearly these factors do affect the efficiency and effectiveness of the monitoring procedure.

Problem Finding Rates

As of early May, 1978, 84.7 percent of project screens had found some health or medical condition requiring attention. About 21.7 percent of these cases required only immunizations (either at the time of the screen or later), but a full 63.0 percent listed one or more problems other than immunizations. Virtually all of these problems were either treated or referred for treatment; as discussed in Chapter V, fewer than 3.1 percent of abnormal conditions were noted with "treatment (being) not advised or warranted".* The mean number of problems found per screen has been 1.06 excluding immunizations, and 1.27 with them. (These immunization figures include both those brought current for age at the time of the screen, and those requiring a second immunization visit).

Appendix Table A-7 shows rather large differences in problem finding rates by both patient age and provider type. The percentage of screens with at least one problem (excluding immunizations) rises steadily from 59.1 percent for infants to 72.2 percent for children 14 and over. The mean problem count per screen also rises steadily from 0.94 to 1.25. Inclusion of immunizations greatly reduces age differences because so many infants and younger children require shots.

Provider differences are even more striking, and these persist even when immunizations are included. The percentage of screens with at least one non-immunization problem has been 78.1 percent for high volume providers, 47.0 percent for the low volume group, 54.5 percent for community clinics and 48.0 percent for TPCHD. The mean number of problems per screen has ranged from 0.73 for low volume providers to 1.37 for the high volume group. When immunizations are counted, these figures rise to 1.02 and 1.53, respectively. The differences between high volume and low volume providers is especially intriguing and will be further discussed below.

---

*See Attachment Five for these case closure statuses.

Types of Problems Found

Tables A-7 and A-8 look at two different ways of classifying the types of problems that have been found. Table A-7 analyzes problem-finding rates by the step numbers of Section F from the screening sheet. (See Chapter Two and Attachment Two for discussion of the screening sheet). This table is useful because it ties in directly with the project screening sheet, but it may count a single condition under more than one step. Table A-8 regroups problems by their ICDA codes, as described in Attachment Six. This method does provide an unduplicated problem count, but it is in some ways less precise. Both tables will be referenced in the following discussion.

There are two main conclusions to be drawn here. The first is that acute conditions such as respiratory and skin problems have been very common. Using Table A-7, we see that 21.0 percent of screens have found nose and throat problems and that 18.7 percent have reported skin conditions. The second is that dental, vision, and hearing problems have each been reported from 2.5 percent or fewer of screens. While acute conditions are likely to be more common than dental, vision, and hearing deficiencies, the relative proportions found here suggest a strong curative rather than preventive orientation.

Problem-finding rates by type differ once again by both age group and provider type. Looking at Table A-7, we see that problems in the following categories generally increased in frequency with age:

eyes
nose and throat
neurological
social-emotional
intellectual development
vision

while the following problems became less frequent:

lungs
skin
musculo-skeletal
nutritional

These age differences are generally as one would expect them to be.

Provider differences are once again greater than those between age groups, as again demonstrated by Table A-7. Differences are especially large in:

HCT/Hb
nose and throat
GU
skin
social-emotional
dental
vision
hearing

High volume providers showed the highest results for the first four of these steps, while TPCHD (well-child clinics) scored highest on the last four. Either the children seen by these providers are different, or the types of screens which they perform yield different results.

Some Conclusions and Comparisons

One of the findings of this review is that project screens have found a high number of total problems, but a low number of dental and vision deficiencies. Sixty-one percent of TPCHD project screens have reported problems other than dental and immunizations, compared to 30 percent nationally. Dental problems have been found in 2.5 percent of screens compared to 26 percent in Michigan. For children under seven, 1.3 percent have had dental deficiencies compared to 10.9 percent nationally. Vision problems have been reported from 0.8 percent of Pierce County project screens compared to 2.3 percent nationally. (See Table IV-1). The Pierce County project, in brief, has reported a high number of apparently acute conditions, and a low number of chronic ones. Differences between providers have also been quite large.

Some Possible Explanations

Age Distribution

Some of the differences between Pierce County and the nation, or between provider groups within the project, may be due to the age distribution of clients. Two statistics may be compared: the proportion of screens with problems of all types, and the proportion with particular problems. Let us look first at the possibility that age distribution explains the high proportion of screens with problems, for the project as a whole, and for high volume providers in particular.

Unfortunately, national statistics on the proportion with problems are not available with age controls. Earlier we showed, however, that:

a. Pierce County clients are generally younger than those screened elsewhere, and

b. younger clients have fewer problems on average than older ones.

TABLE IV-1: PROPORTION OF SCREENS WITH DENTAL, HEARING, AND VISION PROBLEMS: CHILDREN UNDER SEVEN, FIRST QUARTER, 1977

	Dental	Vision	Hearing
Pennsylvania	5.5%	2.8%	0.9%
Oklahoma	7.3%	2.2%	2.4%
Michigan	10.9%	4.0%	2.1%
Texas	-	1.1%	0.5%
Washington	1.9%	0.6%	1.7%
National	10.9%	2.3%	1.3%
Pierce County*	1.3%	0.8%	1.0%

---

*Project to-date.

These two factors should reduce the proportion with problems and clearly do not explain the high proportions found in the Pierce County project.

Age distribution also does not explain the high total problem-finding rate for high volume providers in comparison with other project screeners. Table IV-2 shows the proportion of screens with problems, and the mean number of problems per screen, with simultaneous controls for both age and provider type. If we look first at the upper left quadrant (proportion with problems, excluding immunizations) and read down four rows in each column, we see that high volume providers are the most likely to find at least one problem in every age group. When screening children 14 to 20, for example, high volume providers found problems in 94.5 percent of screens, compared to community clinic findings of only 36.8 percent. Similar differences appear in all four quadrants; high volume providers found more problems than other screeners regardless of the age group considered. Age distribution clearly does not explain the differences between high volume providers and other screeners.

Age distribution also does not explain the low proportion of screens with dental and vision problems and, in fact, age control tends to accentuate provider differences. Our earlier Table A-7 showed the proportion of total screens with problems of specified types, without considering that certain of the tests are only appropriate for certain children. In the absence of state or federal guidelines, screeners exercise professional judgment about the appropriateness of specific tests. Table A-9 lists seven tests which are clearly appropriate only for certain population groups, and it shows the proportion of screens with problems within these groups.

Dental testing, for example, is not usually necessary below age three, so Table A-9 looks at those three and over only. Here we see that 5.8 percent of screens have reported dental problems, with a range from 2.9 percent for community clinics to 12.2 percent for TPCHD. Vision problems are found in 4.3 percent of screens for those aged four and over, with a range of 0.6 percent (community clinics) to 12.0 percent (TPCHD). Differences are smaller and less interesting for other tests. Age distribution only partly explains the low proportion of Pierce County screens with these types of problems.

Motivation for Visit

In projects having an aggressive case finding component, persons who receive EPSDT screens may be considered to be reasonably representative of the eligible population as a whole. If 10 percent of those screened are found to have problem X, it may be assumed, in a very rough way, that about 10 percent of the total eligible group has problem X, even including those who do not get screened. Pierce County appears to have an effective case finding approach for infants, initially through the well-baby program, and now through the EPSDT project's rescreen monitoring, but there does not appear to be vigorous case finding for those over age one.* The data forms do not tell us whether persons

---

*The project, though, will be arranging annual rescreens.

TABLE IV-2: PERCENT OF SCREENS WITH PROBLEMS, AND MEAN NUMBER OF PROBLEMS PER SCREEN, BY AGE AND PROVIDER TYPE

		Excluding Immunizations				Including Immunizations			
		1	1-6	7-13	14-20	1	1-6	7-13	14-20
PROPORTION WITH PROBLEMS	High Volume	71.3%	80.6%	85.0%	94.4%	92.2%	94.0%	94.4%	98.6%
	Low Volume	44.6%	48.4%	50.7%	51.2%	77.3%	78.2%	66.0%	75.6%
	Community Clinics	63.2%	53.8%	43.4%	36.8%	82.6%	77.5%	65.8%	52.6%
	TPCHD	27.7%	42.9%	60.9%	69.0%	85.1%	79.0%	82.6%	69.0%
NUMBER OF PROBLEMS PER SCREEN	High Volume	1.19	1.48	1.49	1.70	1.40	1.62	1.59	1.74
	Low Volume	0.65	0.79	0.91	0.83	0.96	1.09	1.07	1.07
	Community Clinics	0.97	0.79	0.59	0.79	1.16	1.02	0.82	0.95
	TPCHD	0.36	0.76	1.16	1.00	0.94	1.12	1.38	1.00

visit the doctor because they have a problem and then get screened, or, alternatively, whether they schedule the screens simply as a preventive health measure. The data presented in this chapter are bedeviled by this uncertainty; we simply do not know whether these findings can be extrapolated to all EPSDT eligibles in Pierce County or to eligibles elsewhere in Washington State.

Since there is only limited case finding in Pierce County, we suspect that many of the children screened in this project are either currently or recently sick at the time they are screened. Children may visit their physician or clinic primarily because they need acute episodic care rather than because they have a preventive health orientation. This is probably not true for TPCHD clients because the well-child clinics lack treatment facilities, but it may well be true for other providers.

Most physicians queried by the project prefer to screen children at a separate visit rather than when they are sick, but nearly all of them do at least some EPSDT screening during sick visits. Some providers report that children will not return for a separate EPSDT visit*,while others note that a physical exam is often necessary for a complete diagnosis. Some providers, including one high volume physician, report that a child appearing for a sick visit will always be screened at the same time, unless he or she was recently screened. Even children who return for a separate screen may be treated for the earlier problem, and so one way or the other, problems are likely to appear in the project data system. The high problem finding rate for the project as a whole may just reflect the manner of recruitment for screening.

A major conclusion from this is that problem finding rates may be greatly affected by the type of case finding that a particular project uses, especially in the one-step mode where treatment and screening occur together. If children are primarily screened in connection with sick visits, the problems that are reported and subsequently monitored are likely to be the kind that parents are already aware of, and they may be the type that get into the health care system even without EPSDT. These screens should, of course, still uncover dental, vision, and other less obvious problems however, and so they are still desirable, but problem finding rates are likely to be skewed by the large proportion of acute problems. Comparisons with other projects must be carefully interpretted in light of different case finding methodologies.

In this connection, it should be noted that one high volume provider has reported problems from all but 0.6 percent of his screens, and that much--but not all--of the difference between the high and low volume group is due to this provider's screens. Provider differences reported here cannot be generalized outside the project because we do not have enough different providers for statistical significance. Differences within provider groups may be greater than differences between them. Providers are likely to differ in their problem finding rates because of differences in training and in the nature of their clientele, and the data system provides no basis for judging the quality of screens.

---

*Children enter the project system when they are screened, so case monitors do not normally assist clients to return for screening after treatment. A physician who wants to be certain that a particular child is screened is likely to do so during the treatment visit rather than to try to make other arrangements.

Conclusions

In the project to-date, 63.0 percent of screens have reported at least one problem, for an average of 1.06 problems per screen. Skin and nose and throat problems have been especially common, while very few dental and vision problems have been reported. The total problem finding rate has been about double that reported elsewhere, while rates for dental and vision have been lower.

We have also found large differences among provider groups and especially between the high volume group and all others. Much--but not all--of the latter difference is due to the high problem finding rate of one physician. We lack an adequate sample of providers to make statistically significant comparisons between provider groups.

The high total problem finding rate probably occurs because most children are screened either during or soon after a sick visit. (This is not true for TPCHD screens, however). The problem finding rate would almost certainly be quite different if there were an aggressive case finding method inputting apparently well children into the system. This does not explain the low finding rate for dental problems, however, and the project is investigating this further.

CHAPTER FIVE

THE TREATMENT AND REFERRAL OF PROBLEMS

A screener who finds that a child has a problem has a number of treatment options to consider. In some cases, treatment may not be considered advised or warranted and so the condition may merely be recorded without further action. This has happened with 3.1 percent of experimental problems so far.* Problems needing treatment may be completely treated at the first visit, may only be referred, or may be both treated at first visit and referred. Referrals may be back to self or to some other dentist, physician, or clinic. Some "problems" found at screening may later be found to be false positives. This chapter analyzes these processes for different problem types, providers, and age groups.

Treatment and Referral in the Experimental Group

Table A-10 shows problem disposition for both the control and the experimental group, within age, provider and ICDA categories. Looking first at the experimental group, we find that 77.9 percent of problems received at least initial treatment on the same day as the screen, while 66.3 percent required at least one follow-up appointment. These proportions total to more than 100 percent because 44.2 percent of problems were both treated and referred. About a third (33.7 percent) of problems were fully treated at screen, with a steady rise by age from 27.1 percent for infants to 52.7 percent for those 14 and over. TPCHD treated only 17.9 percent of its problems during screening, while the other three provider groups each treated more than 70 percent. By ICDA, digestive system problems (these are mostly dental) were the least likely to be treated and the most likely to be referred.

Differences between the Control and Experimental Groups

Table A-10 strongly suggests that providers changed either their referral practices or their EPSDT reporting after the project switched from its control to experimental phases. In the control group, 48.3 percent of problems were referred, compared to 66.3 percent in the experimental.** The proportion treated at screen also rose from 68.9 percent for the control group to 77.9 percent in the experimental. These changes are apparent in all age groups and for all providers except TPCHD. Asterisks show that many of these differences are significant for a two-tailed test at the 0.05 level of confidence.

---

*The data system required that a problem sheet be filled out for every problem reported, so screeners may underreport problems that they decide not to treat or refer.

**Results for the control group were derived from the screening sheet, while those for experimental screens came from medical referral sheets. The latter results were also done from screening sheets for age and provider groups, and the two methods yielded nearly identical results.

The bottom section of Table A-10 shows increased referral rates for some major ICDA categories but very small changes for other groups. The proportion of skin problems referred rose from 21.6 percent in the control group to 56.4 percent in the experimental. The rate for infectious diseases rose from 21.2 percent to 52.8 percent, while that for respiratory problems went from 18.8 percent to 44.0 percent. The types of problems with increased referral rates appear to be mainly acute episodic rather than long term chronic.

Providers appear to have changed their referral practices now that they can be certain that children will return for a second visit. The ICDA groups showing the biggest increases are those with a large number of acute episodic problems, such as colds, skin conditions, and infectious diseases. Prior to case monitoring, providers may have asked parents to call if these problems persisted; now they may routinely schedule a subsequent check-up. The increase in referrals does not result from postponement of initial treatment. In fact, more treatment is being given at screening in addition to more treatment later. This may be improving the quality of such care, but we are unable to evaluate this directly.*

To Whom Referred

To whom are patients referred? This is a most interesting question, for which we have only limited data at the present time. While data forms allowed providers to indicate to whom they were referring, this item was not coded for computer entry until approximately April 1978. Virtually all control group problems have this item coded, but only about a third of the experimental forms do.

Table A-11 shows to whom problems were referred for the control group. This shows that 64.1 percent of referred problems were referred to self, while 35.9 percent were referred to others. The proportion referred to self declined strikingly from 88.0 percent among infants to 21.4 percent among teenagers. The community clinics and TPCHD seem to make the most of their referrals to other providers, while physicians keep most of their cases in-house.

---

*This change in referral practices does not invalidate the experimental design because a similar change would presumably occur with statewide case monitoring. If children had been randomly assigned to the control or experimental group without provider knowledge, we would not have seen this effect and results might have been misleading.

By ICDA group, Table A-11 shows highest proportions referred to others for mental disorders, digestive system problems (mostly dental cases), musculoskeletal and birth defects. In all other groups, a majority of problems were referred to self.

Data for the experimental group are not yet complete since 'to whom referred' has only been determined for 76.1 percent of referred problems. Those with missing data are mostly those which were not treated at the first visit,* and probably more than half of these were referred to others. The project is now coding this datum for screens already on file, and future reports will both show the experimental group and the type of other provider to whom patients were referred.

Immunization Status

Finally let us look at patient immunization status before and after screening (see Table A-12). Results to-date show that 46.2 percent of children enter their screen with complete immunizations while 53.8 percent require further shots, either at the screen or later. Older children and those screened by community clinics are the most likely to be current for age before screen, while TPCHD shows an especially high proportion needing further shots. The need for shots may, in fact, motivate at least some of the visits to TPCHD clinics. Only 9.1 percent of children require further immunizations after the initial screening visit. This proportion is low (7.4 percent) for infants because their shots can be given in series during routine rescreens; if fewer rescreens were authorized during this first year of life, the need for specific immunization monitoring would increase. Return visits are more often required for preschool children because they also get shots in series but have no routine rescreens. Teenagers are able to get all of their shots at once and report few immunization referrals.

Immunization levels reported for the project may not represent Pierce County as a whole because of the absence of explicit case finding. The present sample is a self-selected one, and children outside the group may be somewhat less in contact with the health care system. Once again, findings from a project without active case finding should only be cautiously compared with those from an outreach activity.

Summary

One-third (33.7 percent) of problems found in the experimental project have been fully treated at the screen, while an additional 44.2 percent have been both treated and referred for at least one additional visit; 22.1 percent of problems have been referred without treatment at screen, for a total referral proportion of 66.3 percent. The proportion of problems referred has been highest for infants and for TPCHD clients and it has been lowest for teenagers and low volume providers.

---

*For closed problems not treated at first visit, the problem status section of the referral sheet distinguishes referrals to self from referrals to other.

All providers except TPCHD changed their treatment and referral practices when the project moved from its control to its experimental phases. The increase in referral rates has been especially great for such acute episodic conditions as skin and respiratory problems and infectious diseases, suggesting that providers are more routinely scheduling check-up visits instead of leaving them to parental discretion. This change does not invalidate the project's experimental design because a similar shift would probably occur in a statewide activity.

CHAPTER SIX

THE CASE MONITORING SUBSYSTEM

The Pierce County EPSDT project is labelled "Demonstration in Follow-up", and the project has clearly put most of its emphasis on this component. Children are considered to have entered the case monitoring subsystem as soon as they appear for their first screen. Case monitors may then be required to:

a. ensure screen completion;
b. arrange for periodic rescreens; and
c. monitor treatment visits either until they are completed or until six months have passed.*

To do these things, the project has developed a variety of internal management procedures and has leased a van to provide patient transportation.

During the initial project design, concern was expressed that differences in follow-up not be attributable to differences between community health workers (CHWs). Thus, if high volume providers showed good treatment success while low volume providers were less successful, evaluators wanted to be sure that this did not occur because the first had better case monitoring than the second. Case worker differences have been found to be quite significant in the Dallas project,** and we wanted to randomize their effects in Pierce County.

The project sought to randomize effects both by requiring uniform monitoring procedures from all CHWs and by randomly assigning cases. These procedures have been written down and very detailed criteria have been established for determining case closure statuses. All case closures are checked by a supervisor (generally the assistant project director), and any questionable cases are discussed with the project director. These monitoring procedures remain in effect and continue to be supervised.

To further distribute case worker effects, the project assigned cases randomly without regard to geographic location. This procedure would not, of course, be followed by a routine operational program, but it was considered desirable for meeting research objectives. Pierce County--and even the city of Tacoma--is quite large, however, and cost estimates based on randomized assignment were not expected to represent potential state costs because the state would not assign in this manner.

---

*Case workers spend about 85% of their time on treatment follow-up, with the remainder being devoted to screen completion and infant rescreens.

**HSRI, Final Evaluation Report-Phase IV. EPSDT in an Urban Setting - Dallas, Texas, September 15, 1978.

Beginning in May, new cases were distributed by geographic area so that each CHW took on new cases from only a limited area. (Previously assigned cases were retained). While this is clearly less random than before, an analysis of cases on file by geographic area showed little potential bias. Such patient characteristics as age, ethnicity and provider type, are fairly evenly distributed with only minor exceptions. We do not expect follow-up results to be distorted, and cost estimates will clearly be more valid.

A. Screen Completions

Project case monitors assist in screen completion if so requested by the provider. As of early August, 1978, this had been necessary for 97 experimental screens, or 4.0% of those on file. The definition of screen completion is left to the individual provider, and there is probably some variation in individual practice.

Table VI-1 shows screen completion status as of August for both the control and the experimental groups. In the control group, 97.5% of screens were completed at the first visit compared to 96.0% in the experimental phase. In both the experimental and control groups, teenagers and TPCHD clients were least likely to be complete at first visit. Subsequent visits closed all but 2.0% of control screens and 1.6% of experimental ones.

One of the project's initial hypotheses was that the "model case monitoring system will have a higher rate of screen completions per number of shows for screening". In the control phase of the project, 98.0% of screens were completed at either the first or second visit, while this proportion has risen slightly to 98.4% after case monitoring. This comparison, though, somewhat understates the project's impact, because providers seem more willing to mark screens as incomplete at first visit now that monitors are available to help complete them.

Table VI-2 counts only those screens which were not considered complete at the first visit and shows that monitoring has significantly improved the proportion of these completed at later visits. Of 37 control screens not completed at the first visit, 18.9% were closed later, compared to a 59.8% proportion for the experimental group. Although case sizes are small, significant improvements are shown for most age and provider comparisons.

These results must be interpreted cautiously because HSRI and the project decided not to contact parents or providers to determine whether some of these 37 control group screens were completed after data forms were collected. We made this decision when it became clear that a very high proportion (98.0%) of control screens were completed and that statistical improvement on this proportion was unlikely. The proportion completed after first visit is underestimated for the control group, so we cannot be certain that the hypothesis has been supported.

B. Infant Rescreens

The State of Washington has authorized up to five EPSDT screens during an infant's first year of life, and the TPCHD project has actively assisted parents

TABLE VI-1: PERCENT OF SCREENS COMPLETED

	COMPLETED SCREENS				
	N*	Completed at First Visit	Completed at Second Visit	Total Completed	Incompleted Screens
			CONTROL GROUP		
Total	1,494	97.5%	0.5%	98.0%	2.0%
Age					
Under 1	669	99.0%	0.6%	99.6%	0.4%
1-6	516	95.9%	0.6%	96.5%	3.5%
7-13	239	98.7%	0.0%	98.7%	1.3%
14-20	70	91.4%	0.0%	91.4%	8.6%
Provider					
High Volume	749	98.3%	0.3%	98.6%	1.5%
Low Volume	411	96.1%	1.2%	97.3%	2.7%
Community Clinics	217	99.1%	0.0%	99.1%	0.9%
TPCHD	117	94.9%	0.0%	94.9%	5.1%
			EXPERIMENTAL GROUP		
Total	2,398	96.0%	2.4%	98.4%	1.6%
Age					
Under 1	902	98.2%	1.0%	99.2%	0.8%
1-6	937	94.1%	3.4%	97.5%	2.5%
7-13	436	95.0%	3.0%	98.0%	2.1%
14-20	123	96.7%	3.3%	100.0%	0.0%
Provider					
High Volume	1,116	98.1%	1.3%	99.4%	0.5%
Low Volume	735	93.5%	4.1%	97.6%	2.4%
Community Clinics	368	96.5%	1.4%	97.9%	2.2%
TPCHD	179	91.6%	4.5%	96.1%	3.9%

---

* Data on file as of August 23, 1978

TABLE VI-2: SCREENS NOT COMPLETED AT FIRST VISIT

	CONTROL			EXPERIMENTAL		
	N	Completed Later	Incomplete	N	Completed Later	Incomplete
Total	37	18.9%	81.1%	97	59.8%*	40.2%
Age						
Under 1	7	57.1%	42.9%	16	56.2%	43.8%
1 - 6	21	14.3%	85.7%	55	58.2%*	41.8%
7 - 13	3	0.0%	100.0%	22	59.1%*	40.9%
14 - 20	6	0.0%	100.0%	4	100.0%*	0.0%
Provider						
High Volume	13	15.4%	84.6%	21	71.4%*	28.6%
Low Volume	16	31.2%	68.8%	48	62.5%*	37.5%
Community Clinic	2	0.0%	100.0%	13	38.5%	61.5%
TPCHD	6	0.0%	100.0%	15	53.3%*	46.7%

---

*Experimental group significantly greater than control group (One-tailed Z-score test at 0.05 level).

in arranging these recommended rescreens. To be fully reimbursed, the screens must occur in the following time periods:

- one screening up to six weeks of age
- one during two to three months of age
- one during four to five months of age
- one during six to seven months of age
- one during eleven to twelve months of age.*

Individual providers have somewhat different rescreen schedules, however, and some do more and some fewer than five in the first year. These scheduling variations greatly complicate the project's task.

In scheduling rescreens, the project initially used monthly management rosters provided by HSRI. The format of these changed frequently because of uncertain timing requirements, but they all included infants who had passed at least two months since the last screen. The project used these rosters to contact parents and to attempt to arrange rescreens. Computerized rosters were almost never up-to-date, however, and they could not reflect the complex nature of the state's timing schedule. The project devised its own internal tickler system for infant rescreens about the time that we closed data entry for this report, and the results of this new system are not yet measurable.

One of the project's hypotheses has been that "the model case monitoring system will have a higher rate of rescreen completions per number of eligibles for rescreening (than has the control group)". The rate of rescreen completions is the actual number of rescreens divided by the expected number. This hypothesis can only be tentatively evaluated at the present time both because the project did not set up its scheduling system until the spring and because few infants have yet reached their first birthday.

For this analysis, we classified infant screens by whether or not they accorded with the state's official schedule. Those that did are labelled "correctly timed", while those that fell in the period between seven and ten months after birth are called "wrong period". A third group called "duplicates" includes repeat screens in officially authorized periods. Rescreen ratios were also calculated three different ways, as detailed below.

Table VI-3 shows the number of infant screens and rescreens in each of these three categories. The proportion of infant screens that were correctly timed was about the same in both the control (76.2%) and the experimental (78.9%) groups. Looking just at rescreens, we see that 66.7% of control group rescreens were correctly timed, compared to 62.2% for experimental children. In the experimental group, 25.6% of rescreens were duplicates compared to 13.0% without case monitoring. Community clinics have an especially high proportion (47.6%) of rescreens that were duplicates. There are other variations by provider type, but they may not be meaningful because of the small case sizes.

---

*The first and second periods overlap by two weeks. No screens are authorized between exactly seven and exactly ten months after birth.

TABLE VI-3: NUMBERS OF INFANT SCREENS AND RESCREENS, BY TIMING STATUS

CONTROL

	All Providers		High Volume		Low Volume		Community Clinics		TPCHD	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Infant Screens										
Correctly Timed	493	76.2%	201	65.7%	231	87.5%	43	84.3%	18	69.2%
'Wrong Periods'	113	17.5%	75	24.5%	24	9.1%	6	11.8%	8	30.8%
Duplicates	41	6.3%	30	9.8%	9	3.4%	2	3.9%	0	0.0%
TOTAL	647	100.0%	306	100.0%	264	100.0%	51	100.0%	26	100.0%
Rescreens										
Correctly Timed	210	66.7%	79	54.1%	110	81.5%	16	76.2%	5	38.5%
'Wrong Periods'	64	20.3%	37	25.3%	16	11.8%	3	14.3%	8	61.5%
Duplicates	41	13.0%	30	20.6%	9	6.7%	2	9.5%	0	0.0%
TOTAL	315	100.0%	146	100.0%	135	100.0%	21	100.0%	13	100.0%

EXPERIMENTAL

	All Providers		High Volume		Low Volume		Community Clinics		TPCHD	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Infant Screens										
Correctly Timed	431	78.9%	212	79.7%	152	82.2%	54	68.4%	13	81.2%
'Wrong Periods'	69	12.6%	27	10.2%	24	13.0%	15	19.0%	3	18.8%
Duplicates	46	8.4%	27	10.2%	9	4.9%	10	12.7%	0	0.0%
TOTAL	546	100.0%	266	100.0%	185	100.0%	79	100.0%	16	100.0%
Rescreens										
Correctly Timed	112	62.2%	67	64.4%	37	69.8%	7	33.3%	1	50.0%
'Wrong Periods'	22	12.2%	10	9.6%	7	13.2%	4	19.0%	1	50.0%
Duplicates	46	25.6%	27	26.0%	9	17.0%	10	47.6%	0	0.0%
TOTAL	180	100.0%	104	100.0%	53	100.0%	21	100.0%	2	100.0%

The increase in the proportion of rescreens that were duplicates is probably not due to any direct project activity. Case workers always allowed at least two months to pass before scheduling rescreens, and all of these duplicates occurred within shorter intervals than that. The difference between the control and experimental groups is statistically significant, nevertheless, and it may be explainable as an indirect effect of treatment follow-up. The project has dramatically improved shows for problem treatment through its case monitoring procedures (see below) and it seems likely that many of these rescreens occurred in conjunction with treatment of problems found earlier. A provider who sees an infant for problem follow-up almost certainly looks for other conditions, too, and these routine checks may be essentially indistinguishable from EPSDT. The project, in short, may have increased its rescreen ratio more because of its treatment monitoring than because of its rescreen scheduling.

Table VI-4 shows the ratio between the actual and the expected number of infant rescreens, using three alternative counts of actual rescreens.* The first line in each case counts only correctly timed rescreens. Using this measure, we see that control group infants had 34.8% of their expected rescreens, while the experimental group had 31.4% of theirs. If those occurring between seven and ten months after birth ("wrong period") are also counted, the rescreen ratio becomes 45.4% for the control group and 37.5% for the experimental. Finally, if all rescreens are counted, the ratios become 52.2% and 50.4% respectively. Regardless of the measure used, the infant rescreen ratio is greater for the control group than it is for the experimental.**

The rescreen ratios in Table VI-4 are somewhat lower than expected for both the control and the experimental groups. As noted earlier, one reason for this is that the project relied on computerized management rosters for most of the period covered by this report, and these were not sufficiently current for the short rescreen intervals called for by the state. A second reason is that screens performed by non-project providers have not so far been entered into our data system; the project plans to do this in the coming year by reviewing Medicaid profiles. All of the data presented above will be reviewed at that time.

C. Treatment Follow-up

Case workers have spent the majority of their time on treatment follow-up, and it is here that the greatest project impact should be felt.*** During the period covered by this report, CHWs were assigned a total of 1,384 problems, or an average of 165 new problems per month (September through April). The number of cases followed has been 855, or an average of 107 per month. (All of the problems found at a single screen are considered to be a case). These figures and others are detailed in Table A-13.

---

*The expected number of rescreens for a particular child was also calculated using the state schedule. Rescreen periods ending after March 31, 1978, were not counted, since screens that occurred after that date may have still be in process when these data were analyzed.

**High volume providers and Community Clinics do show statistically significant improvements for certain measures, however.

***Attachment 7 details the project's case monitoring procedures.

TABLE VI-4: RATIO OF EXPECTED AND ACTUAL INFANT RESCREENS, BY TIMING STATUS

	All Providers		High Volume		Low Volume		Community Clinics		TPCHD	
	No.	%	No.	%	No.	%	No.	%	No.	%
CONTROL										
Expected Rescreens	604		261		270		51		22	
Actual/Expected										
Correctly Timed Rescreens Only	210	34.8%	79	30.3%	110	40.7%	16	31.4%	5	22.7%
Correctly Timed Plus 'Wrong' Periods	274	45.4%	116	44.4%	126	46.7%	19	37.2%	13	59.1%
All Rescreens	315	52.2%	146	55.9%	135	50.0%	21	41.2%	13	59.1%
EXPERIMENTAL										
Expected Rescreens	357		163		150		35		9	
Actual/Expected										
Correctly Timed Rescreens Only	112	31.4%	67	41.1%*	37	24.7%	7	20.0%	1	11.1%
Correctly Timed Plus 'Wrong" Periods	134	37.5%	77	47.2%	44	29.3%	11	31.4%	2	22.2%
All Rescreens	180	50.4%	104	63.8%	53	35.3%	21	60.0%*	2	22.2%

---

*Result is significantly higher for experimental than for control group. (One-tailed Z score test at the .05 level).

This table shows both the control and experimental groups for comparative purposes, although only the latter group was given case monitoring. Slightly more than a third of both problems and cases have involved infants, and more than half have come from high volume providers. The largest proportions of problems followed-up have involved (1) nervous system and sense organs, (2) the respiratory system, and (3) immunizations, and these three categories alone have accounted for 43.5 percent of problems followed. Three-quarters of all cases followed have been from the city of Tacoma and its associated unincorporated areas.

Table A-13 also shows that the experimental group has had a somewhat different distribution of problem types (by ICDA group) than the control group had. The difference is probably related to our earlier finding (Chapter Five) that providers are referring an increased number of acute episodic conditions for a check-up visit rather than completing all treatment at screening. Looking at Table A-13, we see that 15.8% of referred problems in the experimental group have involved the respiratory system compared to 4.3% in the control group. About 9.8% have been skin conditions compared to 1.8% in the control phase. Mental disorders, on the other hand, have fallen from 12.3% to 5.7% of problems, immunizations from 19.6% to 11.9%, and digestive (dental) problems from 11.8% to 6.2%. There is some possibility that these differences might make the experimental group somewhat easier to monitor that the control group would have been, so it will be necessary to control for problem type in subsequent discussions.

Interval to First Treatment - Problems not Treated at Screen

One of the hypotheses of this project is that "the model case monitoring system will have a greater proportion of clients receiving treatment within time limits prescribed by federal regulations (60 days)". We have already seen (Table A-10) that 77.9% of experimental problems received some treatment during the screen, so the 60 day test is really only relevant to the remaining 22.1%. This section looks at two measures-the proportion reaching initial treatment within sixty days, and the proportion ever reaching treatment-and is limited to those not treated at screen. A subsequent section reviews these measures for all problems, including those initially treated at screen.

Table VI-5 shows that of 391 control group problems not treated at screen, 46.0% reached initial treatment within sixty days, compared to at least* 58.3% in the experimental group. This difference is statistically significant for a one-tailed test at the .05 level of confidence. Preliminary results shows similar improvements within most age, provider and ICDA categories; Table VI-5 does not show these details only because of the lack of consistent information (see earlier footnote).

---

*The treatment date recorded on the medical referral form for the experimental group may either refer to the first treatment or to some later treatment visit. The proportion shown above for the experimental group is actually a minimal estimate because first treatment probably occurred earlier in many cases. Control group results are not affected, however, because their first treatment dates were consistently recorded. The project is now obtaining exact first treatment dates for all future referrals.

Looking next at the ICDA groupings, we see that fewer than 50% of control group problems in the following categories reached initial treatment within sixty days:

- nutritional deficiencies, endocrine and metabolic diseases
- blood diseases
- circulatory system
- skin
- musculoskeletal
- immunizations
- all other conditions

Of these, only nutritional and musculoskeletal problems reached the 50% mark through treatment initiated after sixty days. If a project wished to prioritize case monitoring by problem type, it might give particular emphasis to the ICDA groups listed above.

Table VI-5 demonstrates that case monitoring also significantly improved the proportion of problems ever reaching treatment*. The overall improvement was from 54.2% to 77.6%, and it is reflected in all age, provider and ICDA categories. Most of these differences are statistically significant.

Looking just at the control group for the moment, we see that problems among children aged one to six were the least likely to reach treatment while teenagers' problems were the most likely to do so. In fact, more than half (56.5%) of pre-school problems did not reach treatment at all. This may be related to the frequency of immunization problems among pre-schoolers; only 29.5% of these reached treatment within sixty days**, and only 38.5% reached treatment at all. Low volume providers and community clinics showed lower proportions reaching treatment (49.3% and 42.4% respectively) than did the other two provider groups.

The bottom two lines of Table VI-5 take account of the differing problem types in the control and experimental groups (see earlier discussion). The standardized total assumes that the experimental group had the same problem distribution as the control group,*** and by doing this, it completely removes the effect of differing problem distributions. Standardization actually increases the proportion of experimental problems reaching treatment, ever or within sixty days. This shows that the effect of case monitoring is not due to the types of problems followed.

---

*These data are valid for the experimental as well as the control group.

**These are mostly for an immunization series, and many were probably not intended to be done in this time frame.

***See Barclay, George W. 1958. Techniques of Population Analysis, for a technical discussion of standardization.

TABLE VI-5: INTERVAL BETWEEN SCREEN AND FIRST TREATMENT FOR PROBLEMS NOT TREATED AT SCREEN

	CONTROL				EXPERIMENTAL			
	N	Under 60 Days	Total Treated	Not Treated	N	Under 60 Days***	Total Treated	Not Treated
Total	391	46.0%	54.2%	45.8%*	254	58.3%	77.6%	22.4%
Age								
Under 1	106	50.9%	62.3%	37.7%*	52		84.6%	15.4%
1-6	161	33.5%	43.5%	56.5%*	132		72.7%	27.3%
7-13	96	56.2%	60.4%	39.6%*	54		77.8%	22.2%
14-20	28	64.3%	64.3%	35.7%*	16		93.8%	6.2%
Provider								
High Volume	219	46.1%	56.2%	43.8%*	84		75.0%	25.0%
Low Volume	75	38.7%	49.3%	50.7%*	82		82.9%	17.1%
Community Clinic	33	42.4%	42.4%	57.6%*	36		72.2%	27.8%
TPCHD	64	56.2%	59.4%	40.6%*	52		76.9%	23.1%
ICDA								
Infective Diseases and Parasites	9	55.5%	66.7%	33.3%*	8		100.0%	0.0%
Nutritional Deficiencies, Endocrine and Metabolic Diseases	14	35.7%	50.0%	50.0%	11		72.7%	27.3%
Blood Diseases (and blood forming Organs)	20	35.0%	45.0%	55.0%	1		100.0%	0.0%
Mental Disorders	49	55.1%	55.1%	44.9%	15		73.3%	26.7%
Nervous System and Sense Organs	57	63.2%	64.9%	35.1%*	39		82.1%	17.9%
Circulatory System	11	27.3%	36.4%	63.6%*	8		87.5%	12.5%
Respiratory System	16	50.0%	62.5%	37.5%	12		91.7%	8.3%
Digestive System	47	51.1%	66.0%	34.0%	27		77.8%	22.2%
Genito-Urinary System	7	85.7%	85.7%	14.3%	5		80.0%	20.0%
Skin	7	0.0%	14.3%	85.7%*	7		100.0%	0.0%
Musculoskeletal	9	44.4%	66.7%	33.3%	4		100.0%	0.0%
Birth Defects	20	55.0%	70.0%	30.0%	15		80.0%	20.0%
Birth Problems (Perinatal)	6	83.3%	83.3%	16.7%	2		100.0%	0.0%
Accidents, Poisoning, and Violence	8	50.0%	50.0%	50.0%	6		83.3%	16.7%
Immunizations	78	29.5%	38.5%	61.5%*	80		63.8%	36.2%
All Other Conditions	33	36.4%	45.5%	54.5%*	14		100.0%	0.0%
Standardized Total**		46.0%	54.2%	45.8%*		60.3%*	80.8%	19.2%
Total, Excluding Immunizations		50.2%				73.6%*		

---

*Significantly greater than result for comparison group. (One-tailed Z-Score test at the .05 level of Confidence).

**Assumes that the experimental group had the same ICDA distribution as the control group

***Detailed results are not shown for the experimental group because the treatment data recorded may refer to a second or later treatment visit.

Since many immunizations are not expected to reach treatment within sixty days, we also checked results by removing this problem type. This greatly increased the gap between the control and experimental group; the new proportions were 50.2% and 73.6% respectively.

Interval to First Treatment, Including Problems Treated at Screen

The discussion above has excluded problems first treated at screen because case monitoring would not affect interval to treatment. When these are included the proportions treated obviously increase greatly, as shown in Table VI-6. Here we find that 83.2% of all control group problems and 90.5% of experimental ones reached initial treatment within sixty days. When immunizations are excluded, these proportions rise to 88.0% and 96.2%, respectively. The general assumption is that a state would be considered in compliance with federal guidelines if 90% reach treatment within sixty days. The Pierce County project almost reaches this level without case monitoring, and it clearly does so with the experimental input. Case monitoring also reduces the proportion never reaching treatment from 14.2% to 5.1%.

Interval to Problem Closure

The data forms used in Pierce County do not tell us when treatment was completed, but we can get a very rough idea by examining the case closure date. It is only a rough indicator because problems may be closed some number of days after treatment and because a single closure date is used for all of the problems on a referral sheet. This datum, moreover, is only meaningful for experimental group problems having a referral, since these were the only case monitored problems.

In order to evaluate the interval between screen and problem closure, we must add both open and closed problems. Table VI-7 shows that 86.2% of referred experimental problems were closed within 180 days of screen. The most active period of problem closure seemed to be the second month when 21.6% (34.8% minus 13.2%) were closed. About 50% were closed by the end of the third month.

Reading down Table VI-7, we find interesting differences in the speed with which problems have been closed, although these have tended to disappear by the end of the third or fourth month. Problems for children over seven have generally been closed sooner than those for younger children; and problems found at community clinics have been closed much sooner than those from TPCHD.* Immunization problems have been especially slow in reaching closure, as have musculoskeletal and circulatory system problems. Case worker differences have also been fairly large. We cannot, unfortunately, say whether these differences result primarily from problem difficulty, or whether community health workers actually differ in the speed with which they are able to close comparable problems.

Closure Status

Finally, in this chapter, we need to examine the status of EPSDT problems at the time of closure. The next few tables are central to several of the tested hypotheses, and so they need to be examined closely. The ten statuses

---

*TPCHD is slow because 89.1% of its experimental problems have been referred.

TABLE VI-6: INTERVAL BETWEEN SCREEN AND FIRST TREATMENT, INCLUDING PROBLEMS TREATED AT SCREEN

	CONTROL				EXPERIMENTAL			
	N	Under 60 Days	Total Treated	Not Treated	N	Under 60 Days[*]	Total Treated	Not Treated
Total	1,421	83.2%	85.8%	14.2%	2,135	90.5%	94.9%	5.1%
Age								
Under 1	579	88.3%	91.0%	9.0%	698		97.5%	2.5%
1-6	541	77.0%	80.4%	19.6%	872		93.2%	6.8%
7-13	229	83.0%	84.6%	15.4%	434		93.7%	6.3%
14-20	72	86.1%	86.1%	13.9%	131		98.6%	1.4%
Provider								
High Volume	921	87.4%	89.7%	10.3%	1,243		97.0%	3.0%
Low Volume	246	77.3%	81.3%	18.7%	503		94.7%	5.3%
Community Clinic	158	79.2%	79.7%	20.3%	256		92.5%	7.5%
TPCHD	91	62.9%	65.5%	34.5%	133		80.6%	19.4%
Total, Excluding Immunizations:	1,303	88.0%			1,963	92.6%		

---

[*] Detailed results are not shown for the experimental group because the treatment date recorded may refer to a second or later treatment visit.

TABLE VI-7: PROPORTION OF REFERRED PROBLEMS CLOSED, BY INTERVAL SINCE SCREEN (EXPERIMENTAL PROBLEMS ONLY)

	30 Days	60 Days	90 Days	120 Days	150 Days	180 Days	N
Total	13.2%	34.8%	51.4%	65.1%	76.8%	86.2%	1,384
Age							
Under 1	11.0%	32.2%	50.1%	66.2%	77.2%	86.4%	497
1-6	12.5%	34.5%	51.5%	65.0%	77.8%	87.3%	570
7-13	18.1%	38.0%	54.1%	65.6%	77.4%	88.1%	256
14-20	18.6%	43.9%	50.9%	57.4%	63.5%	70.0%	61
Provider							
High Volume	13.9%	37.2%	51.6%	65.1%	75.2%	85.2%	783
Low Volume	10.4%	30.2%	48.1%	62.5%	79.3%	87.1%	300
Community Clinic	20.3%	37.3%	59.6%	77.9%	87.0%	93.3%	186
TPCHD	4.3%	25.7%	44.7%	50.0%	62.7%	78.6%	115
CHW							
1	9.5%	28.0%	42.5%	58.8%	69.2%	80.7%	489
2	11.9%	32.4%	50.5%	58.5%	77.6%	90.8%	226
3	14.1%	37.2%	59.2%	71.7%	78.2%	85.8%	459
4	21.0%	45.2%	55.2%	71.6%	85.6%	90.8%	210
ICDA							
Infective Diseases and Parasites	19.6%	39.0%	54.1%	64.7%	80.0%	92.9%	47
Nutritional Deficiencies, Endocrine and Metabolic Diseases	13.6%	40.0%	50.0%	64.9%	69.4%	82.4%	48
Blood Diseases (and blood forming organs)	7.1%	22.7%	46.8%	58.7%	76.1%	88.1%	104
Mental Disorders	8.3%	25.7%	40.3%	58.9%	68.5%	84.0%	79
Nervous System and sense organs	16.9%	43.6%	59.6%	75.3%	83.1%	90.2%	219
Circulatory System	3.8%	16.0%	33.3%	42.9%	68.4%	84.2%	27
Respiratory System	24.2%	48.0%	60.0%	73.3%	79.0%	88.3%	218
Digestive System	6.0%	24.7%	40.3%	50.0%	75.5%	82.7%	86
Genito-Urinary System	12.2%	43.8%	65.9%	73.7%	78.9%	86.5%	49
Skin	20.1%	49.2%	64.4%	76.1%	85.4%	91.8%	136
Musculoskeletal	0.0%	7.1%	21.4%	30.8%	70.0%	70.0%	20
Birth Defects	8.2%	32.1%	52.1%	70.5%	78.6%	87.5%	64
Birth Defects (Perinatal)	8.0%	16.0%	21.7%	45.0%	45.0%	60.0%	25
Accidents, Poisoning, and Violence	5.3%	22.2%	53.3%	64.3%	69.2%	75.0%	20
Immunizations	1.9%	14.3%	32.8%	50.9%	71.4%	82.2%	165
All Other Conditions	14.3%	36.4%	53.2%	63.8%	73.6%	80.8%	77

for case closure listed on Form 3 are insufficiently descriptive in themselves, and so the detailed closure procedures developed by the project are appended (Exhibit 5). These have been applied consistently and with some rigor to both the control and experimental groups in spite of the frequently different manner in which data were obtained. The differences in closure status between the control and experimental groups are remarkable.*

Table VI-8 lists the ten recorded case closure statuses and the distribution of problems on them. Looking first at the "total" column for the control group, we see that 29.4% of problems were closed with treatment completed, and that 34.2% were closed because of treatment refusal or repeated appointment failure. These results are much different for the experimental group; with case monitoring, 62.4% problems were completely treated and only 3.9% were closed because of refusals or appointment failure.

There are also large differences between the control and experimental groups in the proportion of problems which were still under treatment six months after screen. Nearly a quarter of control problems fell into this category, suggesting that without case monitoring, many parents remain aware of problems, but without taking the initiative to resolve them. The low figure (6.9%) for experimental problems is biased downwards because only a few problems could have been as much as six months old by the end of April. We doubt, nevertheless, that it will ever be as high for the control group.

The second column of Table VI-8 shows the ICDA standardized distribution of case closure statuses. It has been noted earlier that the experimental group has a lower proportion of problems than the control group in such difficult areas as mental disorders and immunizations, while having a greater proportion of 'easier' skin and respiratory problems. Standardization assumes that the experimental group had the same problem distribution as the control group, and it can be seen that this does reduce the experimental proportion with treatment completed while raising the proportion of refusals. Differences between the control and experimental groups remain large and significant, however, and it is clear that differing problem distributions do not explain them.

The final columns of Table VI-8 show closure statuses by whether the problem in question was referred to self or referred to other. These data for the experimental group are quite tentative because the number of problems known to have been referred to others has been quite small. This table shows that 40.8% of control problems referred to self were closed because of treatment refusal or repeated appointment failure, compared to only 1.9% in the experimental group. The experimental portion may change slightly with time, but this difference is likely to remain very large. Within the control group, there were only half as many such failures for referrals to other (22.9%) as

---

*Since problems which are fully treated at screen cannot be affected by case monitoring, the following discussion pertains chiefly to the two-thirds of problems which involve more that one visit. Tables are also based only on closed problems: a large number of experimental problems are still open along with about 75 problems from the control group.

TABLE VI-8: PROBLEM CLOSURE STATUSES FOR REFERRED PROBLEMS

CONTROL GROUP

			AGE				PROVIDER				REFERRAL	
	Total	ICDA Standardized Total	Under 1	1 - 6	7 - 13	14 - 20	High Volume	Low Volume	Community Clinics	TPCHD	To Self	To Other
N	395	395	109	161	97	28	222	76	33	64	250	140
alse ositive	0.8%	0.8%	1.8%	0.6%	0.0%	0.0%	0.5%	2.6%	0.0%	0.0%	1.2%	0.0%
reatment ompleted	29.4%	29.4%	31.2%	23.0%	36.1%	35.7%	29.7%	30.3%	30.3%	26.6%	24.0%	37.9%
reatment erminated	2.0%	2.0%	0.9%	1.9%	3.1%	3.6%	1.8%	1.3%	3.0%	3.1%	2.0%	2.1%
nder reatment months fter eferred	23.8%	23.8%	31.2%	19.3%	21.6%	28.6%	26.6%	15.8%	9.1%	31.3%	21.6%	27.9%
reatment ot Advised	0.3%	0.3%	0.0%	0.0%	1.0%	0.0%	0.0%	1.3%	0.0%	0.0%	0.4%	0.0%
reatment ot Available	0.3%	0.3%	0.0%	0.0%	1.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.7%
amily Moved	3.3%	3.3%	0.0%	7.5%	0.0%	3.6%	3.6%	2.6%	6.1%	1.6%	4.0%	2.1%
nable to ontact	5.8%	5.8%	3.7%	6.2%	6.2%	10.7%	7.2%	2.6%	12.1%	1.6%	5.6%	6.4%
efused Treatment/ epeated Appointment ailure	34.2%	34.2%	31.2%	41.6%	29.9%	17.9%	30.2%	43.4%	39.4%	34.4%	40.8%	22.9%
ther	0.3%	0.3%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0	1.6%	0.4%	0.0%
			EXPERIMENTAL GROUP									
N	867	867	298	370	156	43	500	179	129	59	583	*
alse ositive	1.5%	1.5%	0.0%	2.4%	1.3%	4.7%	0.8%	1.7%	0.0%	10.2%	0.0%	
reatment ompleted	62.4%	53.9%	73.2%	56.8%	62.2%	37.2%	64.6%	55.9%	70.5%	45.8%	71.0%	
reatment erminated	4.3%	4.8%	0.3%	4.3%	8.3%	16.3%	2.4%	10.1%	3.1%	5.1%	2.6%	
nder Treatment months fter eferred	6.9%	11.0%	6.0%	4.6%	9.0%	25.6%	6.6%	8.9%	3.9%	10.2%	6.0%	
reatment ot Advised	3.1%	4.3%	1.7%	4.3%	2.6%	4.7%	3.8%	1.7%	2.3%	3.4%	2.2%	
reatment ot Available	0.7%	0.8%	1.3%	0.3%	0.6%	0.0%	1.0%	0.6%	0.0%	0.0%	0.7%	
amily Moved	5.4%	5.6%	4.4%	7.6%	2.6%	4.7%	6.4%	3.4%	5.4%	3.4%	4.3%	
nable to ontact	10.7%	10.8%	9.7%	14.3%	5.8%	4.7%	11.8%	11.2%	4.7%	13.6%	10.1%	
efused Treatment/ epeated Appointment ailure	3.9%	5.9%	1.6%	5.4%	5.1%	2.3%	2.2%	3.9%	8.6%	8.5%	1.9%	
ther	1.0%	1.5%	1.7%	0.0%	2.6%	0.0%	0.4%	2.8%	1.6%	0.0%	1.2%	

Insufficient data.

there were for referrals to self (40.8%), suggesting that patients are more convinced that a problem needs treatment when it is referred to someone new. We may, in the end, find that case monitoring in this project has more effect on referrals to self than on referrals to others.

Four of the project's nine hypotheses refer to treatment outcomes, although two of these hypotheses are actually the same.* The four quantities to be measured are:

1c: case retentions
1d: problem resolutions
1e: case completions
2c: case conversions

A case includes all of the problems found at a single screen. Attachment 8 shows how the project's ten closure statuses have been regrouped to calculate these quantities.

Problem Resolutions

Hypothesis 1d of the project's original proposal predicts that, "The model case monitoring system will have a higher rate of problem resolutions per number of confirmed problems". A problem is considered to be resolved if it is completely treated or if treatment is not advised or warranted (see Exhibit 8 for details). Table VI-9 confirms this hypothesis, both for referred problems and for total problems.

Table VI-9 is divided into two halves, one of which shows the problem resolution rate for referred problems only and the other which adds in those problems which were fully treated at the time of screen. In the control group, only 41.9% of referred problems were resolved, compared to 76.2% in the experimental group. Case monitoring, in other words, resolved an additional 34.3% of problems beyond the traditional system without monitoring. Improvements are shown in every age, provider and ICDA group, and most of these are statistically significant.

When problems fully treated at screen are added in, we see that 71.9% of control group problems were resolved without case monitoring compared to 84.9% in the experimental group. These differences are significant in every age and provider group but not for some ICDA categories.

The ICDA standardized total (bottom line) once again shows that differences between the control and experimental group are not due to differences in problem distribution.

Tables A-12 and VI-9 can be combined to show total immunization levels for project clients both before and after screening. In the control group, 91.4%

---

*See Chapter One for a complete list of the nine hypotheses.

TABLE VI-9: PROPORTION OF PROBLEMS RESOLVED

	Excluding Problems Fully Treated at Screen		Including Problems Fully Treated at Screen	
	Control	Experimental	Control	Experimental
Total	41.9%	76.2%*	71.9%	84.9%*
Age				
Under 1	47.9%	80.0%*	75.0%	86.2%*
1-6	31.0%	70.3%*	65.4%	80.7%*
7-13	51.3%	81.4%*	76.8%	89.1%*
14-20	55.5%	83.3%*	82.1%	92.6%*
Provider				
High Volume	43.2%	76.5%*	75.2%	85.8%*
Low Volume	40.3%	75.6%*	70.2%	85.1%*
Community Clinics	36.7%	79.0%*	69.2%	85.2%*
TPCHO	43.2%	68.1%*	48.8%	71.7%*
To Whom Referred				
Self	34.2%	80.7%*		
Other	48.7%	**		
ICDA				
Infective Diseases and Parasites	57.1%	96.3%*	90.9%	98.0%*
Nutritional Deficiencies, Endocrine and Metabolic Disorders	22.2%	60.7%*	76.1%	72.3%
Blood Diseases (and blood forming organs)	15.4%	59.3%*	57.7%	66.4%
Mental Disorders	24.0%	66.7%*	36.3%	75.2%*
Nervous System and Sense Organs	53.5%	76.7%*	69.0%	83.1%*
Circulatory System	22.2%	57.1%*	53.3%	65.9%
Respiratory System	50.0%	82.5%*	90.6%	92.3%
Digestive System	61.5%	70.5%	73.0%	78.1%
Genito-Urinary System	83.3%	90.3%	93.8%	93.5%
Skin	14.3%	87.0%*	81.5%	92.7%*
Musculoskeletal	50.0%	100.0%*	78.4%	100.0%*
Birth Defects	46.2%	76.5%*	58.2%	80.5%*
Birth Problems (Perinatal)	0.0%	77.8%	27.3%	81.5%*
Accidents, Poisoning, and Violence	50.0%	71.4%	85.4%	84.9%
Immunizations	38.2%	61.2%*	38.2%	61.2%*
All Other Conditions	34.6%	85.0%*	57.1%	87.8%*
ICDA Standardized Total	41.9%	71.6%*	71.9%	83.6%*

---

*Significantly different from control group result (One-tailed Z-score tests at the .05 level).

**Insufficient number of cases.

were current for age when the screen was completed, and 3.3% were brought current in subsequent visits, bringing the total to 94.7%. The comparable proportions in the experimental group were 90.6%, 5.8% and 96.4%, for a 1.7% improvement. Of those who were not current before screening in the control group, 85.0% were made current during the screen and 5.7% were brought current later for a total coverage of 90.7%. These figures were 73.0%, 10.2% and 83.2% respectively in the experimental group.

Case Conversions/Completions

Hypothesis le of the project's original proposal predicts that, "The model case monitoring system will have a higher rate of case completions per number of confirmed unwell cases", while 2c states that, "Clients served by the model case monitoring system will show a higher rate of case conversions, that is, unwell to well cases". Exhibit 8 shows how case conversion is defined, and we find no difference between conversion and completion.

Table VI-10 shows that case monitoring has improved the case conversion ratio from 37.0% in the control group to 70.1% in the experimental. This is a large and statistically significant improvement, and it is reflected in all age and provider comparisons shown. Community clinics and TPCHD have the lowest ratios (28.6% and 29.0% respectively) without case monitoring and rise to 72.5% and 62.5% respectively after the experimental input. Case monitoring has had a clearly demonstrable impact on case conversions.

Case Retentions

Table VI-10 also supports the project's hypothesis that, "The model case monitoring system will have a higher retention rate, that is, fewer eligibles lost to the program". The proportion retained is similar to the proportion converted except that cases still under treatment are counted in both the numerator and the denominator. In the control group, 52.3% of cases were retained compared to 74.3% since case monitoring. The retention rate before monitoring was especially low for preschool children (40.1%) and for community clinics (35.9%), and monitoring brought them close to the group average.

These findings regarding case monitoring should not be compared to those from other programs without careful observation of two factors. The first is that Pierce County lacks an agressive case finding program (for reasons noted elsewhere), and so a higher proportion of screens are linked with acute episodic care. Parents who motivate themselves to have a screen may need rather little extra motivation to come for treatment. Problems found at screen in this situation are more likely to be obvious to the parent--some, in fact, were probably known or suspected beforehand--and so monitors may have to do less convincing. The second factor is that a very high proportion of problems are treated at screening. Case monitoring is likely to have much greater effects when these circumstances do not pertain.

Treatment Outcomes

Two additional hypotheses are not being tested for this report because the case monitoring system has not been in place long enough. Hypothesis 2a

TABLE VI-10: PROPORTION OF CASES CONVERTED AND PROPORTION OF CLIENTS RETAINED (CASES WITH AT LEAST ONE REFERRAL ONLY)

	PROPORTIONED CONVERTED				PROPORTION RETAINED			
	Control		Experimental		Control		Experimental	
	N	%	N	%	N	%	N	%
Total	257	37.0%	693	70.1%*	340	52.3%	806	74.3%*
Age								
Under 1	77	44.2%	252	74.2%*	107	59.8%	292	77.7%*
1-6	109	24.8%	291	64.6%*	137	40.1%	331	68.9%*
7-13	57	49.1%	124	75.0%*	74	60.8%	143	78.3%*
14-20	14	42.9%	26	69.2%	22	63.7%	40	80.0%
Provider								
High Volume	128	39.8%	350	68.9%*	174	55.7%	408	73.3%*
Low Volume	62	40.3%	177	73.4%*	74	50.0%	208	77.4%*
Community Clinics	35	28.6%	109	72.5%*	39	35.9%	122	72.5%*
TPCHD	31	29.0%	56	62.5%*	52	57.7%	67	68.6%

---

*Significantly greater than control group result (One-tailed Z-score test at the .05 level).

predicts that, "Clients served by the model case monitoring system will show greater improvement in health status, as measured by general healthiness ratings, and by severity ratings of specific problem conditions". Number 2b says that, "Clients served by the model case monitoring system will show greater preventive healthiness, as reflected by the currency of their immunization status, and assessments of their dental health." These hypotheses will be reviewed and evaluated at the time of the final report.

Untreated Problems

Before leaving this section, let us look briefly at the types of problems which do not reach treatment, with and without case monitoring. Table VI-11 distributes two types of problems: those having no treatment at all, and those for which treatment was refused. (The first category excludes problems given some treatment at screening, while the second includes some that were only partially treated, at the screen or later.) The figures for the control group gives us some idea of where case monitoring can potentially have its greatest effect. About half of untreated control group problems were found among children one to six, and about half were found by high volume providers. The largest ICDA groups were immunizations (26.8%), mental disorders (12.3%), nervous system and sense organ disorders (11.2%), and all other conditions (10.1%). The age and provider distribution is similar in the experimental group, but a much higher proportion of untreated problems are immunizations. At some later point, it will be useful to look more closely at these untreated problems.

Project Transportation

The differences between the control and experimental groups discussed above do not appear to be due to the provision of transportation for patients during the experimental phase. Forty-three patients were transported one or more times during the period covered by this report.* Twenty-five of these were infants, and twenty-seven were patients of high volume providers. All except seven of them lived in the Tacoma zip code area (98401 to 98499). These 43 patients were 2.3% of those screened.

This low van usage may be explainable by the fact that Pierce County does not have an aggressive case finding activity. Patients do not enter the EPSDT system unless they are able to get to the screens on their own. Since they did this on their own, they are probably able to get to treatment as well. The Pierce County experience should not be generalized to areas having active case finding.**

---

*This number includes only those transported for problem completion. Altogether, the van made 101 trips for screen completion, infant rescreens, and problem resolution during the period October through May.

**The average cost per patient trip has been $38.38. During the seven months covered by this report, vehicle leasing costs totaled $1,122.72, while the cost of EPSDT related time spent by the driver has been $2,546.59. (This figure includes a portion of project overhead costs.) Gasoline and maintenance cost $196.38 (including an estimate for April.)

TABLE VI-11: DISTRIBUTION OF UNTREATED PROBLEMS

	CONTROL		EXPERIMENTAL	
	Never Treated	Refused Treatment	Never Treated	Refused Treatment
N	179	135	57	34
Age				
Under 1	22.3%	25.2%	14.0%	14.7%
1-6	50.8%	49.6%	63.2%	58.8%
7-13	21.2%	21.5%	21.1%	23.5%
14-20	5.6%	3.7%	1.8%	2.9%
	100.0%	100.0%	100.0%	100.0%
Provider				
High Volume	53.6%	49.6%	36.8%	32.4%
Low Volume	21.2%	24.4%	24.6%	20.6%
Community Clinic	10.6%	9.6%	17.5%	32.4%
TPCHD	14.5%	16.3%	21.1%	14.7%
	100.0%	100.0%	100.0%	100.0%
ICDA				
Infective Diseases and Parasites	1.7%	2.2%	0.0%	0.0%
Nutritional Deficiencies, Endocrine and Metabolic Diseases	3.9%	4.4%	5.3%	5.9%
Blood Diseases (and blood forming organs)	6.1%	5.9%	0.0%	11.8%
Mental Disorders	12.3%	11.1%	7.0%	5.9%
Nervous System and sense organs	11.2%	13.3%	12.3%	14.7%
Circulatory System	3.9%	4.4%	1.8%	2.9%
Respiratory System	3.4%	4.4%	1.8%	0.0%
Digestive System	8.9%	8.1%	10.5%	11.8%
Genito-Urinary System	0.6%	0.7%	1.8%	0.0%
Skin	3.4%	3.7%	0.0%	2.9%
Musculoskeletal	1.7%	0.0%	0.0%	0.0%
Birth Defects	3.4%	4.4%	5.3%	5.9%
Birth Problems (Perinatal)	0.6%	0.7%	0.0%	0.0%
Accidents, Poisoning, and Violence	2.2%	2.2%	1.8%	2.9%
Immunizations	26.8%	25.9%	50.9%	35.3%
All Other Conditions	10.1%	8.1%	1.8%	0.0%
	100.0%	100.0%	100.0%	100.0%

D. Case Monitoring Costs

Project costs have been analyzed for the seven months between October 1, 1977 and April 30, 1978. Estimates include all EPSDT related time spent by case workers, one clerk, one messenger/driver, and one supervisor, but they exclude time spent on such research activities as data collection, control group follow-up, and proposal development. All project overhead costs are attributed to case monitoring. These data do not, of course, include the cost of screening and treatment, although these will be estimated later from Medicaid billing tapes.

Results to-date show that $3,209.08 has been spent on the scheduling of infant rescreens, and that 254 rescreens have occurred. The cost per successful rescreen has been $12.63. We do not, of course, know how many of these rescreens were actually scheduled by the project since many may have occurred without case worker intervention.

To-date, $2,463.14 has been spent on screening completions. This amounts to $28.31 per case worked on, or $47.37 per screen completed at second visit.

The cost per problem followed may be computed in several different ways, and data must be interpreted carefully. If all referred medical, dental, and immunization problems are counted in both the numerator and the denominator, the cost per problem has been $29.07 ($33,571.99 divided by 1,155). Since the average case has had 1.65 problems, the cost per case has been $48.10. Dental problems can be easily excluded from these averages because they involve a visit to a separate provider; the cost per dental problem followed has been $28.16. Exclusion of these costs from medical problem costs does not change the $29.07 average quoted earlier.

Immunization costs are the most difficult to interpret because they represent a mixture of cases. Most immunizations probably occur in conjunction with some other treatment, and so the marginal case monitoring cost is likely to be small. Those that occur by themselves are likely to be fairly costly; thus raising the overall average. The mean cost of $16.53 represents neither the cost of adding immunizations to a problem treatment, nor the cost of arranging immunization by itself; it is acutally an average of the two.

It should be pointed out, once again, that the figures presented above are for case monitoring only and do not include the cost of screening and treatment. A study based on Medicaid billing profiles is now under way and will be completed for the final report. The results of this study, when added to the case monitoring costs shown above, will yield a more complete estimate of incremental costs resulting from EPSDT.

E. Summary

Chapter VI has reviewed all nine of the project's hypotheses and found strong support for five of them. Three others were not tested either because we need an additional year's data or because the hypothesis was a duplicate of one of the others. Only one hypothesis has not been supported so far, and we expect even this one to be positive when additional data are collected.

The nine hypotheses are fully discussed in Chapter Seven.

CHAPTER SEVEN*

SUMMARY OF MAJOR FINDINGS

Overview

This is an interim report on the Pierce County (Washington) EPSDT Demonstration Project, covering the period June 1977 through approximately April 30, 1978. It is the first interim report, and has been scheduled so as to include preliminary tests of several experimental hypotheses. This report was prepared by the Health Services Research Institute of San Antonio, under Contract Number 1993-AGF-12950(2) with the Washington State Department of Social and Health Services.

The major thrust of this project has been to "demonstrate the effectiveness of a follow-up system in assuring that children found to have problems during screening receive diagnosis and treatment."

The project is most effectively accomplishing this objective. It has developed a follow-up (case monitoring) system from identification of eligibles screened, to treatment and treatment completion, including forms, client/provider feedback, full-time case monitors, and a supporting data processing component to include periodic case management rosters of incomplete actions and rescreen scheduling.

It has now "piloted" this model for a period of approximately ten months (August 1977 to June 1978) and, as a consequence, has learned of modifications prerequisite to promulgating a model for possible statewide utilization. Some of these modifications are proposed for testing in the follow-on project year (1978-1979).

The remainder of this report summarizes project activity through approximately April 30, 1978.

Project Background and Objectives

The Washington State Department of Social and Health Services (DSHS) began discussion of a special EPSDT project late in 1974, at a time when the need for a statewide EPSDT program was becoming increasingly evident. The project was intended both to lay the groundwork for such a statewide program and to test certain modes of case monitoring that would be of interest to other states as well. The Health Services Research Institute (HSRI) became involved in these discussions early in 1975, and in 1976 was selected as the evaluation contractor on a sole source basis. The project design reflected the Institute's experience with EPSDT across the country, and made considerable use of concepts and evaluation models that HSRI had developed and tested elsewhere.

---

*This chapter was prepared by the project based on HSRI findings from Chapter One through Chapter Six. The project's grant proposal labels it "Executive Summary".

Since its inception in December 1976, the project has adhered closely to several broad objectives and considerable progress has been made toward their achievement. As stated in the original grant application, these objectives are as follows:

> The primary purpose of this project will be to collect program and cost information relative to the existing EPSDT program and to examine the impact of introducing an innovative case monitoring and follow-up model. The innovative model will take the form of full-time community health workers with the assigned responsibility of ensuring the continued participation of children who have been screened; i.e., keeping appointments for diagnosis and treatment, showing for rescreening at periodic intervals, etc. Enhancing existing screening provider efforts at following up of screened children, this model will include frequent telephone and personal contacts with parents of the children, and offers of transportation when necessary. Specifically the objectives are:
>
> 1. To introduce an aggressive follow-up program from point of screening that will maximize the number of children brought through prescribed diagnosis and treatment to point of problem resolution.
> 2. To implement a reporting system that will provide information about the types of problems identified, diagnoses made, treatment prescribed, problems resolved, and costs for diagnosis and treatment.
> 3. To determine the most cost effective procedures for case monitoring and follow-up, comparing existing and innovative models.

Case finding was specifically excluded from the project design, both because it was already being thoroughly tested elsewhere, and because the State felt that case monitoring was the more essential activity.

Although this project was intended primarily as a pilot demonstration project, the following formal research hypotheses were set forth for testing:

1. Case Monitoring Subsystem Performance Indicators
    a. The Model CMS will have a higher rate of screen completions per number of "shows" for screening.
    b. The Model CMS will have a higher rate of rescreen completions per number of eligibles for rescreening.
    c. The Model CMS will have a higher retention rate; i.e., fewer eligibles lost to the program.
    d. The Model CMS will have a higher rate of problem resolutions per number of confirmed problems.

e. The Model CMS will have a higher rate of case completions per number of confirmed unwell cases.

f. The Model CMS will have a greater proportion of clients receiving treatment within time limits prescribed by federal regulations (60 days).

2. Treatment Outcomes

   a. Clients served by the Model CMS will show greater improvement in health status as measured by general healthiness ratings, and by severity ratings of specific problem conditions.

   b. Clients served by the Model CMS will show great "preventive" healthiness as reflected by the currency of their immunization status, and assessments of their dental health.

   c. Clients served by the Model CMS will show a higher rate of case conversions, i.e., unwell to well cases.

The current report tests six of these hypotheses using data collected through April, 1978 and offers further discussion of three others. The hypothesis on screen completions was not tested because 97% of control group screens were completed at first visit, and the experimental group could not be expected to improve significantly on this. The two hypotheses related to healthiness ratings were intended to apply to annual rescreens and there have been too few of these so far to evaluate. All hypotheses will be further tested in a later report.

Provider and Client Characteristics

Provider Characteristics

During the first year of the project, a total of 27 physicians and clinics have provided EPSDT screens, and have signed contracts to complete data forms and cooperate with case monitoring activities. Screeners have fallen into three broad types: private physicians, publicly-funded community clinics, and the Tacoma-Pierce County Health Department (TPCHD).

A total of 23 physicians, all but five of them pediatricians, have participated in the project. Most of these physicians are located in Tacoma, with three in Puyallup and one in Eatonville.

Three community clinics have participated, but by far the largest provider in this group has been the Hilltop Community Maternal/Child Services. Funded primarily through WIC, clinic personnel are particularly well-trained in nutrition and clinics are frequently staffed by a physician who treats problems on-site.

The third provider, Tacoma-Pierce County Health Department, operates periodic adolescent health clinics and well child clinics at 17 locations throughout the county. These clinics are primarily preventive in orientation and do little treatment on-site. Their clients come from the near poverty group who are too poor to pay for discretionary health care, but who are not eligible for Medicaid.

Screeners in Pierce County may also be distinguished as offering either one-step or two-step screens. Screens performed by physicians are generally considered one-step screens because most of the problems they identify can be treated without referral elsewhere. Screens performed by the nurses and volunteers of the Tacoma-Pierce County Health Department are two-step screens because the problems they identify must be referred to a different provider for diagnosis and treatment. Additionally, because of the likelihood of immediate treatment, in the one-step process it is probable that a higher proportion of the EPSDT clients who visit physicians are either currently or recently sick than those who visit the TPCHD.

Number of Screens

During the period covered by this report, project personnel collected data on 3,288 screens, and on 2,548 different individuals. The number of screens has averaged 296 per month, of which 229 have been initial screens, and 67 rescreens. Almost half of these 3,288 screens have been done by three physicians and by the Hilltop Clinic. Ten of the project's 27 screeners have each performed more than 100 screens. High volume physicians have performed 47.5% of screens or an average of 141 per month; low volume providers, 29.9% or an average of 88 per month. Community clinics have performed 14.8% of screens or an average of 44 per month; TPCHD, 7.6%, or an average of 21 per month.

Client Characteristics

Nearly 70% of those screened have been reported to be Caucasian, and 20% Black. About 52.4% of those screened have been boys; 47.6% girls. The vast majority of those screened (98.0%) have reported Pierce County zip codes; 81.1% have reported City of Tacoma zip codes.

The age of those screened appears skewed in comparison both with the probable distribution of eligibles and with the age distribution of screens for the United States as a whole. In the project, 40.8% of screens to-date have been on children under age one, and 78.1% have been on those six or younger. In contrast, United States data show that 39.5% of eligibles and 45.0% of those screened have been six or younger.

The following three factors favor the inclusion of infants in the project and may explain the skewed age distribution:

1. local physicians and providers strongly encourage prenatal and well baby visits among mothers of all income groups

2. the project's rescreen monitoring encourages infants to remain in the system

3. the absence of aggressive case finding among the EPSDT-eligible population-at-large limits their participation in the program.

Problems Found at Screening

Data

As of early May, 1978, 63.0% of project screens had reported at least one problem, excluding immunizations. Virtually all of these problems were either treated or referred for treatment; fewer than 3.1% of abnormal conditions were noted with "treatment not advised or warranted". The mean number of problems found per screen has been 1.06.

These problem finding rates differ by both patient age and provider type. The percentage of screens with at least one problem, excluding immunizations, rises steadily from 59.1% for infants to 72.2% for children age 14 and over. The mean problem count per screen also rises steadily from 0.94 for infants to 1.25 for children age 14 and over.

Provider differences are even more striking than the age differences. The percentage of screens with at least one non-immunization problem has been 78.1% for high volume providers, 47.0% for low volume providers, 54.5% for community clinics, and 48.0% for TPCHD. (It should be noted that much, but not all, of the difference between the high and low volume providers is due to one high volume provider who has reported problems from all but 0.6% of his screens).

A look at the types of problems found shows that acute conditions like respiratory and skin problems have been very common, while dental, vision, and hearing problems have been detected with far less frequency; 21.0% of screens have found nose and throat problems and 18.7% skin conditions; while dental, vision, and hearing problems have each been reported from 2.5% or fewer of screens. Among the providers, high volume providers scored highest for the following problems: HCT/Hb, nose and throat, GU and skin; while the TPCHD scored highest for social-emotional, dental, vision, and hearing.

Some Conclusions and Comparisons

The total problem finding rate for the Pierce County project has been about double that reported elsewhere (61.0% of project screens have reported problems other than dental and immunization compared to 30.0% nationally), while the problem finding rate for dental and vision deficiencies has been quite low (for children under age seven, 1.3% have had dental problems compared to 10.9% nationally; vision problems have been reported from 0.8% of project screens compared to 2.3% nationally).

The high problem finding rate probably occurs because most of the children in the project are screened either during or after a sick visit to a physician. In other words, these children visited their physician or clinic primarily because they needed acute episodic care rather than because they had a preventive health care orientation. The problem finding rate would almost certainly be quite different if there were an aggressive case finding method for encouraging apparently well children to utilize the health care system.

The low problem finding rates for vision and dental problems cannot be explained this way, however, since screenings done on sick or recently sick children should still uncover dental, vision and less obvious problems.

The Treatment and Referral of Problems

Problems which are identified at screening may be completely treated at the time of the screening, may be both treated at first visit and referred for additional treatment, or may simply be referred for treatment to another provider. In the project, one-third (33.7%) of the problems found in the experimental group have been fully treated at the screen, while 22.1% of problems have been referred for a second visit without treatment at screen; 44.2% have been both treated and referred for a second visit, making a total referral proportion of 66.3%. The proportion of problems referred has been highest for infants (72.9%) and for the TPCHD (89.1%) and lowest for children age 14 and over (47.3%) and low volume providers (61.6%).

All providers, except TPCHD, have changed their treatment and referral practices since the project shifted from the control to the experimental phase when case monitoring was initiated. In the control group, 48.3% of problems were referred, compared to 66.3% in the experimental group. The proportion treated at screen also rose, from 68.9% for the control group to 77.9% in the experimental group. These changes are apparent in all age groups and for all providers except the TPCHD.

This increase in referral rates has been especially great for such acute episodic conditions as skin problems, respiratory problems and infectious diseases. The referral rate for skin problems increased from 21.6% in the control group to 56.4% in the experimental group; for respiratory problems, from 18.8% to 44.0%; for infectious diseases, from 21.2% to 52.8%.

The increase in referral rates from the control to the experimental phase suggests that providers are relying on the project's case monitoring system to facilitate return treatment visits. Consequently, they are more routinely scheduling follow-up visits rather than leaving them to parental discretion.

Only limited data are available at this time which indicate to whom patients are referred. In the control group, 64.1% of referred problems were referred to self, while 35.9% were referred to others. The proportion referred to self declined strikingly from 88.0% among infants to 21.4% among teenagers.

Community clinics and the TPCHD made most of their referrals to other providers, while physicians referred most frequently to themselves. Digestive system problems (mostly dental cases), mental disorders, musculoskeletal problems and birth defects were most frequently referred to others. Data for the experimental group are not yet complete.

Finally, regarding immunization status, project results to-date show that 46.2% of children enter their screen with complete immunizations, while 53.8% require further shots, either at the screen or later. Older children and those screened by community clinics are the most likely to be current for age before the screen, while the TPCHD shows an especially high proportion needing further shots. Only 9.1% of children require further immunizations after the initial screening visit.

The Case Monitoring Subsystem

Children enter the project's case monitoring subsystem as soon as they appear for their first screen. Project case monitors may then be required to ensure screen completion, arrange for periodic rescreens, or monitor treatment visits either until they are completed or until six months have passed. In order to accomplish these activities, the project has developed a variety of internal management tools including uniform case monitoring procedures, detailed criteria for case closure statuses and, until recently, random assignment of cases; and it has leased a van to provide patient transportation.

Of these three activities, case workers have spent the majority of their time on treatment follow-up. During the period covered by this report, CHW's were assigned a total of 1,384 problems, or an average of 165 new problems per month (September through April). The number of cases followed has been 855, or an average of 107 per month. (All of the problems found at a single screen are considered to be a case). Slightly more than a third of both problems and cases have involved infants, and more than half have come from high volume providers. The largest proportions of problems followed-up have involved (1) nervous system and sense organs, (2) the respiratory system, and (3) immunizations. These three categories alone have accounted for 43.5% of problems followed. Three quarters of all cases followed have been from the City of Tacoma and its associated unincorporated areas.

The experimental group has had a somewhat different distribution of problem types (by ICDA group) than the control group has had. The difference is probably related to our earlier finding that providers are referring an increased number of acute episodic conditions for a check-up visit rather than completing all treatment at the time of screening; 15.8% of referred problems in the experimental group have involved the respiratory system compared to 4.3% in the control group; 9.8% have been skin conditions compared to 1.8% in the control phase. These problems are generally "easier" to bring to treatment completion than problems in such "difficult" areas as mental disorders and immunizations. In these areas, the experimental group has a lower proportion of problems than the control group. For example, mental disorders have fallen from 12.3% of problems in the control group to 5.7% in the experimental group; immunizations, from 19.6% in the control group to 11.9% in the experimental group; and digestive (dental) problems, from 11.8% in the control group to 6.2% in the experimental. These differences might make the experimental group somewhat easier to monitor than the control group would have been, so it will be necessary to consider this in subsequent discussions.

This section of the report reviews all nine of the project's research hypotheses. Data collected by the project through April, 1978, strongly support five of these hypotheses. Three others were not tested either because additional data are needed or because the hypothesis duplicated another that was tested. One hypothesis has not been supported thus far, although we do expect a positive outcome when additional data are collected. In order of their appearance in the original grant, the nine hypotheses are each discussed below.

1.a. The model case monitoring system will have a higher rate of screen completions per number of shows for screening.

This hypothesis was not tested as originally stated, because 97.5% of control group screens were closed at first visit, and the experimental group could not be expected to improve significantly on this. However, of those screens not closed at first visit, 59.8% of those given case monitoring were closed later, compared to 18.9% of those without case monitoring. Although the number of screens requiring monitoring to completion is quite small, case monitoring does help significantly when it is needed.

1.b. The model case monitoring system will have a higher rate of rescreen completions per number of eligibles for rescreening.

To schedule infant rescreens, the Project initially used monthly management rosters furnished by HSRI. These computerized rosters were almost never up-to-date, however, and they could not reflect the complex nature of the State's periodicity schedule for infants up to age one. During this period, no improvement has yet been demonstrated in the ratio between actual and expected rescreens. The ratio between actual and expected infant rescreens (counting all rescreens) was 52.2% for the control group, and 50.4% for the experimental group.

The Project has now instituted a manual tickler system, and we expect that the results of this system will be available for our next report.

1.c. The model case monitoring system will have a higher retention rate, that is, fewer eligibles lost to the program.

Monitoring increased case retention from 52.3% in the control group to 74.3% in the experimental (a statistically significant difference). The retention rate before case monitoring was especially low for pre-school children (40.1%) and for community clinics (35.9%). Case monitoring has brought them close to the group average.

1.d. The model case monitoring system will have a higher rate of problem resolutions per number of confirmed problems.

Case monitoring increased the proportion of referred problems that were resolved (that is, completely treated or for which treatment was not advised or warranted) from 41.9% in the control group to 76.2% in the experimental group. If we take into account problems which were fully resolved at screen, these proportions increase to 71.9% and 84.9% respectively. Both differences are statistically significant.

1.e. The model case monitoring system will have a higher rate of case completions per number of confirmed unwell cases.

This hypothesis is identical to hypothesis 2.c., which will be discussed below.

1.f. The model case monitoring system will have a greater proportion of clients receiving treatment within time limits prescribed by federal regulations (60 days).

Case monitoring increased the proportion of problems reaching initial treatment within sixty days, as hypothesized. If problems treated at screen are excluded, the proportion reaching initial treatment within sixty days rose from 46.0% in the control group to a minimum of 58.3% in the experimental group. (Experimental results are a minimal estimate because the treatment date recorded on the data form may not be the date of first treatment, but rather of a subsequent treatment visit.) If we exclude immunizations, these proportions rise to 50.2% for the control group, and 73.6% for the experimental group.

In the control group, problems among children aged one to six were the least likely to reach treatment while problems among teenagers were most likely to do so. In fact, more than half (56.5%) of pre-school problems did not reach treatment at all. This may be related to the frequency of immunization problems among pre-schoolers; only 36.4% of these reached treatment within sixty days (although many were probably not intended to be seen in this time frame), and only 45.5% reached treatment at all. Low volume providers and community clinics showed lower proportions reaching treatment (49.3% and 42.4% respectively) than did the other two provider groups.

Looking next at the ICDA groupings, we see that fewer than 50% of control group problems in the following categories reached initial treatment within sixty days:

- nutritional deficiencies, endocrine and metabolic diseases
- blood diseases
- circulatory system
- skin
- musculoskeletal
- immunizations
- all other conditions

Case monitoring also significantly improved the proportion of problems ever reaching treatment. The overall improvement was from 54.2% to 77.6%, and it is reflected in all age, provider and ICDA categories. These data are valid for the experimental as well as the control group, and most of these differences are statistically significant.

The foregoing discussion has excluded problems which were treated initially at the time of screen because in these instances case monitoring did not affect the interval to treatment. If these problems are included, the proportions treated rise from 46.0% to 83.2% for the control group, and from 58.3% to 90.5% for the experimental group. When immunizations are excluded, these proportions rise to 88.9% and 96.2%, respectively.

2.a. Clients served by the model case monitoring system will show greater improvement in health status, as measured by general healthiness ratings, and by severity ratings of specific problem conditions.

This hypothesis will be tested using data from annual rescreens. Since we have very few of these on file now, analysis will be postponed until the final report.

2.b. Clients served by the model case monitoring system will show greater "preventive" healthiness, as reflected by the currency of their immunization status, and assessments of their dental health.

This hypothesis has not been tested. See explanation for hypotheses. 2.a.

2.c. Clients served by the model case monitoring system will show a higher rate of case conversions, that is, unwell to well cases.

Case monitoring has improved the case conversion ratio from 37.0% in the control group to 70.1% in the experimental group. This is a large and statistically significant improvement, and it is reflected in all age and provider comparisons shown. Community clinics and TPCHD have the lowest ratios (28.6% and 29.0% respectively) without case monitoring and rise to 72.5% and 62.5% respectively after the experimental input. Case monitoring has had a clearly demonstrable impact on case conversions.

Additionally, the differences in case closure status between the control and experimental groups are remarkable. In the control group we see that 29.4% of problems were closed with treatment completed, and that 34.2% were closed because of treatment refusal or repeated appointment failure. These results are much different for the experimental group; with case monitoring, 62.4% of problems were completely treated, and only 3.9% were closed because of refusals or appointment failure.

There are also large differences between the control and experimental groups in the proportion of problems which were still under treatment six months after screen. Nearly a quarter of control problems fell into this category, suggesting that without case monitoring, many parents remain aware of problems, but do not take the initiative to resolve them. The low figure (6.9%) for experimental problems is biased downwards because only a few problems could have been as much as six months old by the end of April. Nevertheless, we doubt that it will ever be as high as for the control group.

EXHIBITS

Consent Form for

EPSDT FOLLOW UP-DEMONSTRATION PROJECT

You have brought your child(ren) ______________________________ to the doctor or
Name(s)

clinic for a physical examination, which will be paid for by a child health program called EPSDT*. The State Health Services Division and the Tacoma-Pierce County Health Department are conducting a special project to find ways to improve this program so that more children will receive the health care they need.

We are asking you and your doctor to help us by giving us information on the health of your child. The information will be confidential and will only be seen by your doctor and by project nurses and health workers. If you agree to participate, this is what will happen:

1. The doctor or nurse will examine your child and fill out a form which will give the project the results of the examination.
2. If a problem is found it may be treated immediately or you will be told by your doctor to come back or take the child to another doctor or dentist.
3. When the doctor tells us there is a problem, the project nurse or health worker may call you to discuss the problem and work out a plan to be sure your child gets treated as soon as possible. The project can help make appointments and provide transportation, if needed.
4. When the problem has been treated your name and the child's name will be taken off the form so that no one will be able to identify the information. Until then the forms will be kept in locked files at the project center.

Participation of parents in this project is entirely voluntary. You are free to refuse or drop out at anytime. If you have questions before you decide, ask the nurse or receptionist or call the Project Center - 593-4901.

Rebecca Curneen, RN
Rebecca Curneen, R.N., EPSDT Project Director, 955 Tacoma Avenue South, Tacoma, WA 98402

Parent's Consent Statement

____I voluntarily consent to participate in this project as described above. I realize that I may refuse participation and that I may withdraw once begun, at anytime and that this will not affect any services I may be receiving now or in the future.

____I do not wish to participate in the program described above.

______________________________ __________ ______________________________ __________
Signature of Parent or Guardian Date Signature of Witness Date

ADDRESS PHONE

*EPSDT - Early and Periodic Screening Diagnosis and Treatment Program. A federal-state program to find and treat health problems of children under 21 eligible for Medicaid.

FORM 3

MEDICAL REFERRAL

Child's Medicaid Number (Birthdate)

Child's Name (Last) (First) MI)

Referral Number 04051

Family Name (On Coupon) *(Last)* *(First)* *(MI)* Phone

Child's Address

Zip Code 9 8

Date of Screen MO DA YR

Screening Treatment Provider

Number

	Problem 1	Problem 2	Problem 3
PROBLEM IDENTIFICATION ICDA Code from Screening Sheet			
Problem Description			
Completely New Condition	1 ☐	1 ☐	1 ☐
Previously Known, Under Care	2 ☐	2 ☐	2 ☐
Previously Known, Not Under Care	3 ☐	3 ☐	3 ☐
Problem Treated This Visit	1 ☐	1 ☐	1 ☐
Problem Referred for Diagnosis Treatment	2 ☐	2 ☐	2 ☐
Referred to			

	Problem 1	Problem 2	Problem 3
PROBLEM CLASSIFICATION Treatment date	MO DA YR	MO DA YR	MO DA YR
Suspected Problem Confirmed	YES ☐ NO ☐	YES ☐ NO ☐	YES ☐ NO ☐
If No, New ICDA Code			
& Diagnosis			
	acute ☐ chronic ☐	acute ☐ chronic ☐	acute ☐ chronic ☐
Severity *(Least = 1 Most = 5)*	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Problem Status a Treatment Immunization Completed?	1 ☐	1 ☐	1 ☐
c Treatment Terminated *(Maximum Benefit Achieved)*	2 ☐	2 ☐	2 ☐
c Condition Noted, Treatment Not Advised or Warranted	3 ☐	3 ☐	3 ☐
d Still Under Treatment 1) By this provider	4 ☐	4 ☐	4 ☐
2) Referred elsewhere for further care	5 ☐	5 ☐	5 ☐
Referred to			

IMMUNIZATION FOLLOW-UP

Complete if Immunizations Needed

IMMUNIZATIONS	Check Doses Received					
	None	1	2	3	4	5
Any Combination of DTP, DT and Td						
OPV						
Measles						
Mumps						
Rubella						

Referred to

Date next dose

COMMENTS

(Treatment given)

PROVIDER

SCREENING SHEET

FORM 2

A Child's Medicaid Number (Birthdate)

Date of Service MO DA YR

Child's Name (Last) (First) (MI)

B Sex 1 ☐ M 2 ☐ F

amily Name (On Coupon) (Last) (First) (MI) Phone

ETHNICITY
1 ☐ Black
2 ☐ White
3 ☐ Asian
4 ☐ Native American
5 ☐ Mexican American
6 ☐ Other

Child's Address

Zip Code 9 8

PROJECT SCREENING SEQUENCE
1 ☐ Initial *(first screen since June 1, 1977)*
2 ☐ Infant Rescreen
3 ☐ Annual Rescreen *(12 months after project initial screen)*
4 ☐ Other________________

Child's Regular Physician:

creening Provider: Number

C VITAL SIGNS AND MEASUREMENTS

cm *in*	*grams* *lb/oz*	*cm* *in*		
Height	Weight	Head Circumference *(up to 18 months)*	HCT/Hb	Blood Pressure *(3 years & older)*

D HEALTHINESS RATING

Child's Healthiness Rating

(Current) (Circle most appropriate digit)

1 2 3 4 5 6 7 8 9

Unwell . . . . .Well

E IMMUNIZATION STATUS

Check Only One:

1 ☐ Already current for age before examination
2 ☐ Immunizations administered at screening (brought current for age)
3 ☐ Immunizations required subsequent to screening to make current for age

(If E3 is checked, please list in Section G)

F SCREENING/PROBLEM IDENTIFICATION

(Any item checked as a problem must be entered in Section G)

	*NML	Prob	NA
Ht/Wt/Age 01			
HCT/Hb 02			
Blood Pressure 03			
TB Skin Test 04			
Lead 05			
Sickle Cell 06			
Urine Test 07			
Pap Test 08			
PKU 09			
Eyes 10			
Ears 11			
Nose & Throat 12			
Heart 13			
Lungs 14			
GI 15			
GU 16			
Skin 17			
Musculo-skeletal 18			
Venereal Disease 19			
Contagious Disease 20			
Neurological 21			
Motor Development 22			
Speech/language 23			
Social/emotional 24			
Intellectual Development 25			
Dental 26			
Vision 27			
Hearing 28			
Nutritional 29			

*NML = Normal, PROB = Problem
NA = Not Appropriate

G PROBLEMS

(List all problems checked in Section F, including those treated this visit and E3, if checked)

Problems (Use problem No. from Section F)	ICDA Code	Treated this visit	Referred and to whom
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

(List each problem in this section on Medical Referral sheet)

H COMMENTS

I IS SCREEN COMPLETE?

1st Visit 1 ☐ 2nd Visit 2 ☐ Incomplete 3 ☐

If Screen is Incomplete indicate reason:

Signature ____________________ MD 1 ☐ PNP 2 ☐ Other 3 ☐ __________

Keep first 2 copies until screen complete. Upon completion, return second copy to project.

Tacoma-Pierce County Health Department

E.P.S.D.T. DEMONSTRATION PROJECT
955 TAcoma Avenue South, Room 209
Tacoma, Washington 98402

Date: ____________________

Dear ________________________________ ,

____, is a participant in the E.P.S.D.T. Demonstration Project and has been referred to you for diagnosis/treatment following E.P.S.D.T. screening, for the following problem: ________________________________
____ .

As a participant in this project the individuals medical problems are followed to determine resolution rates with and without case monitoring.

Please complete the information below. Retain second copy and signed consent for your records. Return envelope enclosed.

Sincerely,

Rebecca Curneen, RN
Project Director

ICDA Code			
PROBLEM CLASSIFICATION Treatment date	MO DA YR	MO DA YR	MO DA YR
Suspected Problem Confirmed	YES ☐ NO ☐	YES ☐ NO ☐	YES ☐ NO ☐
If No. New ICDA Code			
& Diagnosis			
	acute ☐ chronic ☐	acute ☐ chronic ☐	acute ☐ chronic ☐
Severity *(Least = 1 Most = 5)*	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Problem Status a Treatment Immunization Completed?	1 ☐	1 ☐	1 ☐
b Treatment Terminated *(Maximum Benefit Achieved)*	2 ☐	2 ☐	2 ☐
c Condition Noted Treatment Not Advised or Warranted	3 ☐	3 ☐	3 ☐
d Still Under Treatment 1) By this provider	4 ☐	4 ☐	4 ☐
2) Referred elsewhere for further care	5 ☐	5 ☐	5 ☐
Referred to			

COMMENTS:

Project Copy

HEA 662 (9/77)

Appendix 8

PROBLEM STATUS/CASE CLOSURE

Definitions of Categories
3/78

01 Treatment/Immunization Completed	Source
*Treated &/or Referred *Problem Resolved	
a) Treated at screen; Problem resolved. No further treatment needed.	Screener
b) Referred; child returned & was treated. Problem resolved. No further treatment needed.	Mother
c) Referred; Problem subsided; No return visit. Mother called Doctor; Dr. OKed not return.	Mother
d) Referred; Mother unsure of problem status. Community Health Worker checks with Assistant Project Director, who checks with Doctor's office. Problem is resolved; Dr. OKs not return.	Doctor's Office
e) Referred to other Screener/Treatment Provider Problem Classification categories a or d. i)a Treatment/Immunization Completed ii)d Still under treatment If d, then must also be b, c or d above	"Other" Form 4

02 Treatment Terminated (Maximum Benefit Achieved)	
*Treated &/or Referred *Because of the nature of the problem, it still remains; however, problem is corrected to maximum status possible.	
a) Treated at screen; Problem remains. No further treatment needed.	Screener
b) Referred; child returned & was treated. Problem remains. No further treatment needed at this time.	Mother
c) Referred; Problem remains; No return visit. Mother called Doctor; Dr. OKed not return.	Mother
d) Referred; Mother unsure of problem status. CHW/APD checks with Doctor's office. Problem remains; Dr. OKs not return.	Doctor's Office

e) Referred to Other Screener/Treatment Provider Problem Classification categories b or d	"Other" Form 4

i)b Treatment Terminated (Maximum Benefit Achieved)
ii)d Still under treatment
If d, then must also be b, c, or d above.

03 Under Treatment 6 Months after Referred	Source
*Referred (Treated & referred OK also) *Further Treatment needed	
a)	
b) Referred; child returned & was treated. Further treatment needed.	Mother
c)	
d) Referred; Mother unsure of problem status. CHW/APD checks with Doctor's office. Dr. says further treatment needed.	Doctor's Office
e) Referred to Other Scr/TX Provider Prob. Class. d. Then also a or b above.	"Other" Form 4

04 Condition Noted; Treatment Not Advised	
*Treated &/or Referred to Other *No further treatment needed	
a) Never referred; just treated this visit	Screener
b)	
c)	
d)	
e) Referred to Other Scr/Tx Provider Problem Class. c.	"Other" Form 4

05 Treatment Not Available

*Referred (Treated and referred OK also)
*Needed Treatment NotCompleted (OK if further treatment also)

	Source
a) Mother attempts to follow up; BUT	Mother
Needed service not available in this community to this child at this time	Appropriate Community Resources
b) Mother attempts to follow up;	Mother
Needed service is available, BUT	
No funding is available in this community to this child at this time, i.e., Medicaid will not pay; family cannot pay their own expense; no other third party payers will pay; no alternative source of financing known	Appropriate Community Resources

06 Family Moved

*Referred (Treated & referred OK also)
*Some Contact with Family by Case Monitor (CHW)

	Source
Family has moved from Pierce County	Mother OR Reliable Source (CHW name source)

a) no treatment received after screen
b) treatment was in process

07 Unable to Contact

*Referred (Treated & referred OK also)
*Unable to make contact with family

08 Refused Treatment

*Referred (Treated & referred OK also)
*Needed Treatment NotCompleted (OK if further treatment also)

	Source
a) Mother appears to be interested in treatment, but doesn't follow through, even with repeated case monitoring; Doctor notified of closure	Mother

i) Van scheduled twice; still did not return for treatment or go for referral to other Dr. notified of closure

ii) Home visit scheduled by phone, with definite appointment, twice; not home at time arranged Did not return for treatment or go for referral to other Dr. notified of closure

	Source
iii) Mother makes 3 appointments and doesn't keep them.	Mother
b) Mother doesn't think problem or treatment is important enough to return to visit doctor or to call doctor to check Doctor notified of closure by CHW/APD	Mother
c) Mother unsure of problem status OR denies problem or need for further treatment. CHW/APD checks with Dr.'s office. Doctor does want return visit or referral to other. Mother still says "no problem" Dr. notified of closure	Doctor's Office

09 Repeated Appointment Failure (Include all under 08 a or b after 3/13/78)

10 Other

Rare Exception. OK with Project Director before using; add to list of each CHW & APD & MDC & OE if to be used on regular basis

False Positive

*Referred to Other (Treated & referred OK also)

Child diagnosed by Other Suspected problem not confirmed AND No new ICDA Code noted	"Other" Form 4

*No blank is marked in Case Monitor - Problem Status/Case Closure section

Exhibit 6: ICDA Groupings

	ICDA Range
Infective Diseases and Parasites	000 136
Pinworms	
TB	
Bacterial infections (scarlet fever/meningitus)	
All others in category (incl. lice, diarrhea, poxes, VD)	
Nutritional Deficiencies, Endocrine and Metabolic Dis.	240 279
Diabetes	
Nutritional deficiencies (avitaminosis/obesity)	
Other endocrine and metabolic dis. (hyperthyroidism, etc.)	
Blood Diseases (and blood forming organs)	280 289
Anemias (iron and other deficiencies)	
Sickle cell trait or anemia	
Other blood diseases (incl. purpura, etc.)	
Mental Disorders	290 315
Behavioral/emotional	
Learning disability	
Mental retardation	
Speech disorders	
Nervous System and Sense Organs	320 389
Convulsive disorders	
Vision problems - refractive (sight loss)	
Eye problems - diseases (strabismus, etc.)	
Hearing problems (hearing loss)	
Ear problems - diseases (otitis media, etc.)	
Other diseases in category (epilepsy, sclerosis, etc.)	
Circulatory System (heart, arteries, lymphatics, etc.)	390 458
All conditions (incl. murmur, infarction, etc.)	
Respiratory System (nose, throat, lungs, etc.)	460 519
Acute respiratory infections (colds, flu, pneumonia, etc.)	
Chronic respiratory infection (frequent recurrences of)	
Asthma	
Hay fever and other allergies	
Other diseases in category (pleurisy, etc.)	
Digestive System (mouth, stomach, intestines, etc.)	520 577
Dental caries	
Other dental and oral problems	
Hernias	
Other diseases in category (colitis, peritonitis, etc.)	
Genito-Urinary System (kidneys, bladder, genitals)	580 629
All conditions (kidney, bladder, genitals, etc.)	
Skin	680 709
All conditions (incl. impetigo, boils, eczema)	
Musculoskeletal (bones, joints, connective tissue)	710 738
All conditions (incl. skeletal deformities, arthritis, etc.)	
Birth Defects	740 759
All conditions (incl. cleft palate & lip, club foot, etc.)	
Birth Problems (perinatal)	760 779
All conditions (incl. abnormal labor and difficult birth)	
Accidents, Poisoning and Violence	800 999
Lead poisoning	
Other conditions in category (incl. fractures and other injury)	
All Other Conditions	(140 239; 630 678; 780 796)
All others (incl. neoplasms, abortion, symptoms [enuresis])	

CASE MONITORING FLOW

1. Cases are assigned to the CHW's by the Assistant Project Director. If a client has previously been case monitored he/she is assigned to the same CHW. The Assistant Project Director reviews all cases to be monitored and assists community health workers in follow-up methodology. The estimated number of new cases per week is eleven (11) per case monitor.

2. Cases with known appointment dates are contacted by telephone call or home visit one week prior to the appointment to determine if the appointment will be kept and whether or not transportation is necessary. (Needed transportation will be arranged with the messenger/driver. See transportation methodology.) If the appointment date is not known, contact is to be made within one week of receiving the referral to determine the appointment time and/or to encourage the family to make an appointment and keep it. After this contact and if the appointment is more than three weeks away, the case worker will again make a telephone call or home visit one week prior to the appointment to determine if the appointment will be kept and whether or not transportation will be needed.

3. At the time of contact, the patient may be either receptive or not receptive to keeping the doctor appointment. If the family is not receptive, the case is closed as "refusal" or "no need," and a refusal letter is sent to the doctor to inform him that our attempts to encourage the family to follow through with care or screening were unsuccessful. If the patient is receptive and intends to keep the appointment, the caseworker contacts the patient one week after the appointment date to learn what happened at the appointment.

4. If the patient kept the appointment and the problem was resolved, the case can be closed (#1 "treatment/immunization complete".) If the appointment was kept but the problem was not yet resolved, the CHW continues cases monitoring until the problem has been resolved (#1 "treatment/immunization complete", #2 "treatment terminated-maximum benefit achieved", or the condition is #3 "still under treatment 6 months after referred".) If the problem still requires

case monitoring, steps three through five are followed.

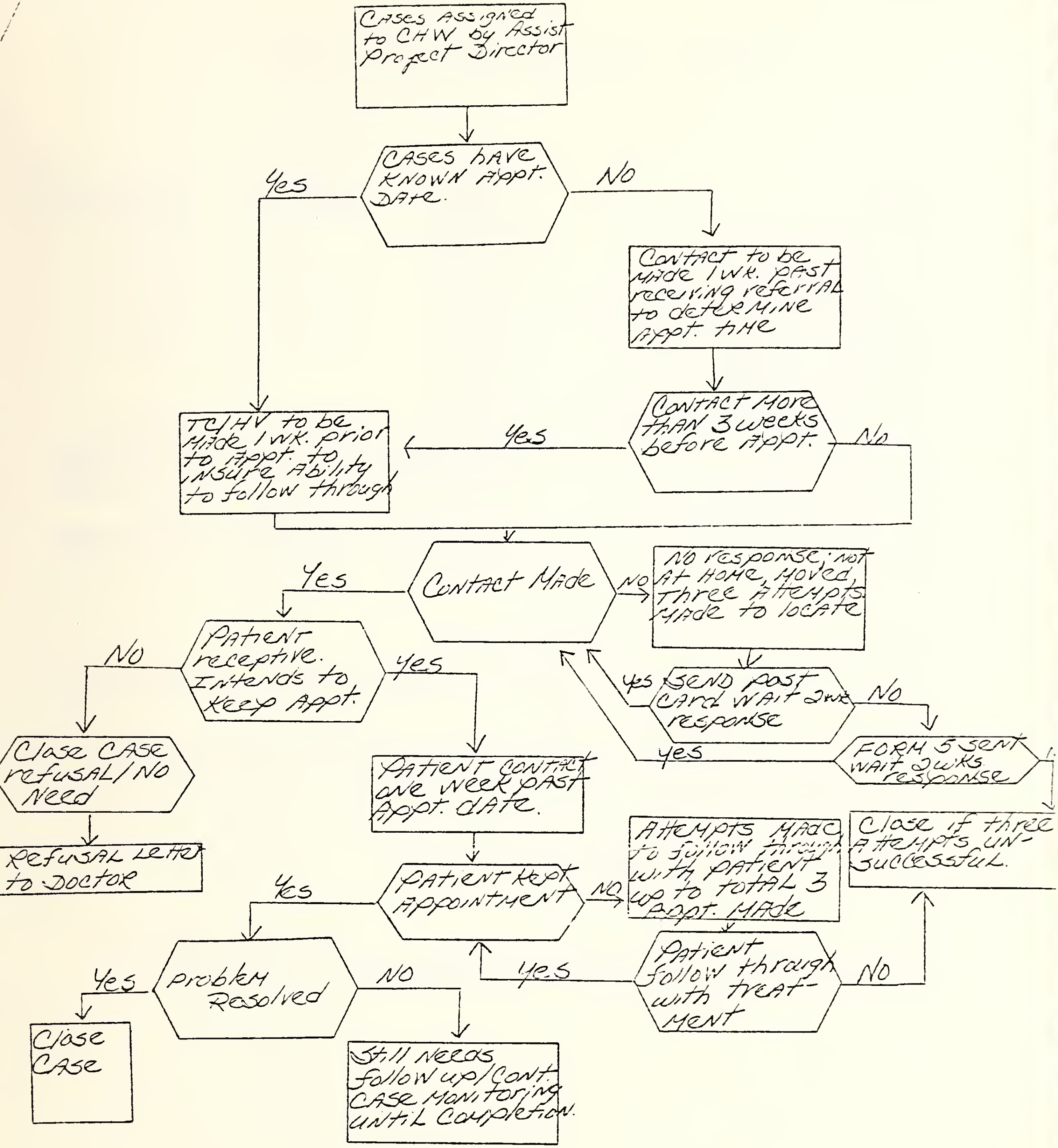
5. If the patient did not keep the appointment, the CHW will make three attempts to encourage them to follow through with care. A patient who does not follow through with care after three contacts is closed as "refused treatment" (or "unable to locate," or"moved".) If after encouragement the patient then follows through with care, procedure in step four is followed.

6. All problems are to be monitored until closed for some specific reason.

7. If the CHW has had no response after three attempts to contact the family, a post card is sent informing the family of the attempts to contact them and asking them to contact the caseworker. "Address correction requested" may be noted on the card. If it appears that the patient has moved (either by not home visit) or by return of the card, the assistant project director may contact the provider's office for information regarding a new address and/or telephone number or a message phone number. If after two weeks there is no response from the post card, a form 5 letter is sent. If within two more weeks there is still no response, the case is closed. If a response is received from either the post card or the form 5 letter, the case is monitored according to steps two through five.

8. If a screening completion is needed, the methodology is the same as for problem follow up except a form 5 letter is not sent.

CASE MONITORING FLOW CHART


Cases Assigned to CHW by Assist Project Director
Cases have known Appt. Date.
Yes
NO
Contact to be made 1 wk. past receiving referral to determine Appt. time
Contact More than 3 weeks before Appt.
Yes
No
TC/HV to be made 1 wk. prior to Appt. to insure Ability to follow through
Contact Made
Yes
NO
No response; not At home, moved, Three Attempts made to locate
Patient receptive. Intends to keep Appt.
NO
yes
Send post card wait 2 wk response
yes
No
Form 5 sent wait 2 wks. response
yes
Close case refusal/No Need
Refusal letter to Doctor
Patient contact one week past Appt. date.
Close if three attempts unsuccessful.
Attempts made to follow through with patient up to total 3 Appt. made
Patient kept Appointment
Yes
NO
Patient follow through with treatment
Yes
No
problem Resolved
Yes
NO
Close Case
Still needs follow up/Cont. case monitoring until completion.

2/78

Exhibit 8: Grouping of Case Closure Statuses

Status	Case Retention	Problem Resolution	Case Conversion/ Completion
0. False Positive	Retained	*	Converted
1. Treatment/Immunization Completed	Retained	Resolved	Converted
2. Treatment terminated/maximum benefit achieved	Retained	Resolved	Converted
3. Under treatment 6 months after referred	Retained	*	*
4. Condition noted; treatment not advised or warranted	Retained	Resolved	Converted
5. Treatment not available	Not Retained	Not Resolved	Not Converted
6. Family moved	Not Retained	Not Resolved	Not Converted
7. Unable to contact	Not Retained	Not Resolved	Not Converted
8-9. Refused treatment/repeated appointment failure	Not Retained	Not Resolved	Not Converted
10. Other	Not Retained	Not Resolved	Not Converted

*Omitted from both numerator and denominator.

Proportion of cases retained: Proportion of cases in which all problems were closed by status 0, 1, 2, 3, or 4.

Proportion of problems resolved: The number of problems that are resolved divided by the total number of problems (excluding false positives and those still under treatment).

Proportion of cases converted/completed: Proportion of cases** in which all problems were closed by statuses 0, 1, 2, or 4.

**Cases in which one or more problems are still under treatment (status 3) are omitted from both the numerator and denominator.

APPENDIX TABLES

TABLE A-1: NUMBER OF SCREENS BY PROVIDER

Provider	Total Screens Number	Total Screens Percent	Initial Screens Number	Initial Screens Percent
1. Dr. Origines	538	16.4%	458	18.0%
2. Dr. Jolley	392	11.9%	211	8.3%
3. Dr. McGroarty	342	10.3%	242	9.5%
4. Hilltop Clinic	297	9.0%	248	9.7%
5. Drs. Coyner & Sparling	291	8.9%	261	10.2%
6. TPCHD	250	7.6%	231	9.1%
7. Drs. Secaur, Walkley, and Wearn	230	7.0%	154	6.0%
8. Eastside Clinic* (Dr. Tanbara)	173	5.3%	131	5.1%
9. Dr. Bayrakci	154	4.7%	121	4.7%
10. Dr. Kemp	148	4.5%	108	4.2%
11. Dr. Giambetti	88	2.7%	61	2.4%
12. Dr. Pearson	77	2.3%	56	2.2%
13. Dr. Padgett	68	2.1%	54	2.1%
14. Others	241	7.3%	212	8.3%
	3,288	100.0%	2,548	100.0%
Provider Groups				
High Volume Physicians	1,563	47.5%	1,173	46.0%
Low Volume Physicians	984	29.9%	743	29.2%
Community Clinics (Hilltop, Eastside, Key Penninsula)	486	14.8%	397	15.6%
TPCHD (Well-Child and Adolescent Health Clinics)	250	7.6%	231	9.1%
Health Maintenance Organization	5	0.2%	4	0.2%
	3,288	100.0%	2,548	100.0%

---

[*] Dr. Tanbara uses the same Medicaid provider number both in his private practice and in his work at the Eastside Clinic. His screens are counted here in the clinic group.

TABLE A-2: DISTRIBUTION OF SCREENS BY MONTH

		GROUP		PROVIDER				AGE			
	All Screens	Control	Expt.	High Volume	Low Volume	Community Clinics	TPCHD	Under 1	1-6	7-13	14-20
June 1977	321	321	0	161	83	53	24	133	125	50	13
July 1977	404	403	1	225	80	54	43	142	146	95	21
August 1977	388	331	57	178	120	54	34	159	117	82	30
September 1977	382	108	274	185	136	39	22	166	125	68	23
October 1977	337	70	267	138	123	52	23	132	143	47	15
November 1977	293	46	247	111	115	54	13	137	111	33	12
December 1977	203	34	169	99	51	36	17	106	75	16	6
January 1978	301	34	267	157	89	42	13	122	111	54	14
February 1978	210	20	190	89	64	40	17	85	85	30	10
March 1978	218	29	189	100	50	43	25	75	92	40	11
April 1978	201	13	188	107	53	22	19	72	83	39	7
May 1978	30	1	29	14	15	1	0	11	12	7	0
	3,288	1,410	1,878	1,564	979	490	250	1,340	1,225	561	162
Mean (Excluding May)	296	-	-	141	88	44	23	121	110	50	15
1977	333	-	-	157	101	49	25	139	121	56	17
1978	232	-	-	113	64	37	18	89	93	41	11

TABLE A-3: COMPARISON OF PROJECT SCREENS WITH COUNTY AND STATE TOTALS

Month	Project	County	State	Project/ County	Project/ State	County/ State
June 1977	321	612	2,449	52.5%	13.1%	25.0%
July 1977	404	871	3,054	46.4%	13.2%	28.5%
August 1977	388	1,358	4,896	28.6%	7.9%	27.7%
September 1977	382	1,096	3,872	34.9%	9.9%	28.3%
October 1977	337	1,593	5,879	21.2%	5.7%	27.1%
November 1977	293	880	3,425	33.3%	8.6%	25.7%
June-Nov. 1977	2,125	6,410	23,575	33.2%	9.0%	27.2%

TABLE A-4: DISTRIBUTION OF TOTAL AND INITIAL SCREENS, BY AGE AT SCREENING AND PROVIDER TYPE

Provider Type/ Screen Sequence	Total		Under 1		1-6		7-13		14-20	
Total Screens	No.	%	No.	%	No.	%	No.	%	No.	%
All Providers	3,288	100.0%	1,340	40.8%	1,225	37.3%	561	17.1%	162	4.9%
High Volume	1,564	100.0%	654	41.8%	571	36.5%	266	17.0%	73	4.7%
Low Volume	979	100.0%	480	49.0%	308	31.5%	150	15.3%	41	4.2%
Community Clinics	490	100.0%	155	31.6%	240	49.0%	76	15.5%	19	3.9%
TPCHD	250	100.0%	47	18.8%	105	42.0%	69	27.6%	29	11.6%
Initial Screens										
All Providers	2,548	100.0%	764	30.0%	1,065	41.8%	557	21.9%	162	6.4%
High Volume	1,173	100.0%	355	30.3%	482	41.1%	263	22.4%	73	6.2%
Low Volume	743	100.0%	279	37.6%	273	36.7%	150	20.2%	41	5.5%
Community Clinics	397	100.0%	94	23.7%	208	52.4%	76	19.1%	19	4.8%
TPCHD	231	100.0%	33	14.3%	101	43.7%	68	29.4%	29	12.6%

TABLE A-5: DISTRIBUTION OF SCREENS, BY PROVIDER TYPE AND ETHNICITY

		PROVIDER TYPE			
	Total	High Volume	Low Volume	Community Clinics	TPCHD
N*	2,994	1,322	945	479	248
White	69.7%	73.9%	70.4%	52.6%	78.6%
Black	20.2%	18.2%	21.4%	28.2%	11.3%
Asian	2.7%	1.5%	1.5%	7.7%	4.0%
Native American	1.5%	1.4%	0.9%	2.5%	1.6%
Mexican American	1.3%	0.8%	1.2%	3.1%	0.0%
Other	4.6%	4.2%	4.6%	5.8%	4.4%
	100.0%	100.0%	100.0%	100.0%	100.0%

---

[*] Excludes those with unknown ethnicity.

TABLE A-6: DISTRIBUTION OF SCREENS, BY PATIENT'S ZIP CODE

Zip Code	Number	Percent
98405	513	15.6%
98404	481	14.6%
98409	280	8.5%
98408	254	7.7%
98371	238	7.2%
98499	186	5.7%
98444	170	5.2%
98406	134	4.1%
98498	122	3.7%
98407	99	3.0%
Others	811	24.7%
	3,288	100.0%
ESSO		
27	1,135	34.5%
48	790	24.0%
49	920	28.0%
51	378	11.5%
Other	65	2.0%
	3,288	100.0%
AREA		
Pierce County		
Tacoma (98401-98499)*	2,665	81.1%
Puyallup	238	7.2%
Sumner	85	2.6%
Spanaway	73	2.2%
Other Pierce County	162	4.9%
Elsewhere	65	2.0%
	3,288	100.0%

---

*Includes unincorporated areas.

TABLE A-7: PERCENT OF SCREENS REPORTING ABNORMAL CONDITIONS

			AGE GROUP				PROVIDER			
Step	Conditions	Total	Under 1	1-6	7-13	14-20	High Volume	Low Volume	Community Clinics	TPCHD
01	Ht/Wt/Age	4.3%	5.1%	2.5%	4.6%	9.9%	4.2%	4.5%	3.9%	5.2%
02	HCT/Hb	6.8%	6.7%	9.3%	2.7%	3.7%	10.9%	1.9%	5.9%	2.4%
03	Blood Pressure	0.1%	0.0%	0.0%	0.0%	1.2%	0.1%	0.0%	0.0%	0.4%
04	TB Skin Test	0.2%	0.0%	0.0%	0.5%	1.2%	0.0%	0.2%	0.4%	0.0%
05	Lead	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
06	Sickle Cell	0.2%	0.1%	0.1%	0.5%	1.2%	0.0%	0.3%	0.0%	0.0%
07	Urine Test	0.8%	0.2%	0.8%	1.4%	3.7%	1.0%	0.9%	0.4%	0.0%
08	Pap Test	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
09	PKU	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
10	Eyes	2.1%	1.8%	2.2%	2.3%	3.1%	1.7%	2.8%	1.3%	3.6%
11	Ears	9.1%	5.4%	12.7%	10.3%	7.4%	12.3%	4.8%	8.2%	7.6%
12	Nose & Throat	21.0%	14.7%	23.3%	28.2%	30.2%	31.2%	12.9%	13.7%	3.2%
13	Heart	1.7%	1.1%	2.7%	1.4%	0.6%	2.0%	1.6%	1.6%	0.8%
14	Lungs	2.7%	3.5%	2.4%	1.6%	1.9%	3.6%	1.6%	3.1%	0.4%
15	GI	2.7%	3.4%	2.0%	3.0%	1.9%	3.0%	2.5%	2.4%	2.8%
16	GU	4.6%	3.7%	5.6%	4.8%	4.3%	6.7%	3.1%	2.9%	1.6%
17	Skin	18.7%	24.9%	15.1%	12.8%	14.8%	25.3%	13.7%	13.3%	7.2%
18	Musculoskeletal	7.3%	9.3%	5.6%	6.8%	4.9%	9.3%	6.4%	4.3%	4.0%
19	Venereal Disease	0.1%	0.2%	0.0%	0.0%	0.0%	0.2%	0.8%	0.0%	0.0%
20	Contagious Disease	0.6%	0.5%	0.9%	0.0%	1.2%	0.3%	0.8%	1.2%	0.8%
21	Neurological	1.2%	0.7%	0.8%	2.5%	3.7%	1.4%	1.0%	1.2%	0.4%
22	Motor Develop.	1.4%	0.8%	1.8%	1.8%	1.9%	1.9%	0.6%	1.4%	1.6%
23	Speech/Language	1.2%	0.1%	1.8%	2.7%	1.2%	1.3%	0.9%	1.4%	1.6%
24	Social/Emotional	3.7%	1.3%	3.0%	8.0%	13.6%	3.6%	1.9%	3.5%	11.6%
25	Intellectual Development	1.3%	0.1%	1.1%	3.9%	3.7%	1.7%	1.1%	1.0%	0.8%
26	Dental	2.5%	0.0%	2.8%	7.7%	3.1%	2.7%	1.5%	1.2%	7.6%
27	Vision	1.7%	0.1%	1.6%	4.3%	6.2%	1.5%	1.3%	0.2%	7.2%
28	Hearing	1.7%	0.1%	2.0%	4.5%	3.7%	1.5%	1.0%	1.2%	6.8%
29	Nutritional	2.5%	3.0%	2.6%	1.6%	0.6%	2.4%	1.8%	4.5%	1.6%
30	Immunizations*	52.4%	58.1%	53.9%	39.4%	38.2%	51.8%	51.8%	40.8%	62.0%
Percent With Problems										
	- excluding immunizations	63.0%	59.1%	63.9%	67.2%	72.2%	78.1%	47.0%	54.5%	48.0%
	- including immunizations*	84.7%	85.4%	85.5%	81.5%	82.1%	93.6%	75.8%	76.3%	80.0%
Mean Number of Problems**										
	- excluding immunizations	1.06	0.94	1.11	1.17	1.25	1.37	0.73	0.81	0.82
	- including immunizations*	1.27	1.20	1.33	1.32	1.35	1.53	1.02	1.03	1.14

---

*Includes those brought current for age at screening.

**Unduplicated count.

TABLE A-8: PERCENT OF SCREENS HAVING PROBLEMS IN VARIOUS ICDA GROUPS*

		AGE				PROVIDER			
	Total	Under 1	1-6	7-13	14-20	High Volume	Low Volume	Community Clinics	TPCHD
Infective Diseases and Parasites	4.7%	4.2%	4.5%	5.6%	6.9%	4.8%	5.6%	3.9%	2.2%
Nutritional Deficienceis, Endocrine and Metabolic Disorders	3.6%	3.1%	1.7%	5.6%	14.9%	2.4%	4.4%	3.9%	7.2%
Blood Diseases (and blood forming organs)	6.7%	6.8%	8.8%	3.0%	3.0%	10.8%	2.1%	6.4%	1.4%
Mental Disorders	5.6%	1.2%	6.4%	12.2%	8.9%	6.1%	5.5%	4.3%	6.5%
Nervous System and Sense Organs	16.1%	7.7%	19.8%	24.3%	17.8%	19.2%	10.3%	13.9%	25.2%
Circulatory System	1.8%	1.3%	2.3%	1.5%	3.0%	1.7%	1.7%	2.8%	0.7%
Respiratory System	26.4%	18.2%	28.2%	35.6%	37.6%	40.2%	15.4%	17.8%	2.9%
Digestive System	6.2%	7.6%	4.3%	8.9%	2.0%	7.4%	5.3%	14.2%	11.5%
Genito-Urinary System	3.9%	3.3%	4.4%	3.3%	5.9%	5.7%	2.7%	1.8%	1.4%
Skin	12.8%	20.1%	9.4%	6.5%	9.9%	17.5%	9.2%	9.3%	5.8%
Musculoskeletal	1.7%	1.2%	1.6%	2.4%	3.0%	2.2%	0.7%	1.8%	2.2%
Birth Defects	4.1%	6.4%	3.2%	2.1%	2.0%	5.7%	3.1%	1.8%	2.9%
Birth Problems (perinatal)	1.6%	3.9%	0.4%	0.0%	0.0%	2.6%	0.9%	0.7%	0.0%
Accidents, Poisoning and Violence	2.0%	1.5%	1.1%	4.7%	4.0%	2.4%	1.9%	1.4%	1.4%
Immunizations**	8.9%	7.7%	12.5%	5.6%	1.0%	5.7%	10.1%	12.1%	17.3%
All Other Conditions	5.1%	5.1%	4.3%	5.9%	7.9%	5.8%	4.4%	4.3%	4.3%

---

*See Exhibit 6 for ICDA groupings. This table shows experimental screens only.

**Only immunizations not completed at screen are included.

TABLE A-9: PERCENT OF CERTAIN SCREENS REPORTING ABNORMAL CONDITIONS, BY PROVIDER TYPE

	All Providers	High Volume	Low Volume	Community Clinics	TPCHD
Blood Pressure (1)	0.2%	0.2%	0.0%	0.0%	0.6%
TB Skin Test (2)	0.3%	0.1%	0.4%	0.7%	0.0%
Sickle Cell (3)	1.8%	2.7%	2.1%	0.0%	0.0%
Pap Test (4)	0.0%	0.0%	0.0%	0.0%	0.0%
PKU (5)	0.0%	0.0%	0.0%	0.0%	0.0%
Dental (1)	5.8%	5.9%	4.3%	2.9%	12.2%
Vision (6)	4.3%	3.6%	3.8%	0.6%	12.0%

Notes

1. Age 3 and over.
2. Age 1 and over.
3. Blacks, initial screens only. Test was marked "not appropriate" for 68.4% of screens.
4. Girls 14 and over.
5. Infants, initial screen only.
6. Age 4 and over.

TABLE A-10: PROBLEM DISPOSITION

	CONTROL GROUP**						EXPERIMENTAL GROUP***					
	N	Total Treated	Treated Only	Treated And Referred	Total Referred	Referred Only	N	Total	Treated	Treated And Referred	Total	Referred Only
Total	1,421	68.9%	51.7%	17.2%	48.3%	31.1%	2,088	77.9%*	33.7%	44.2%	66.3%*	22.1%
Age												
Under 1	579	76.2%	52.0%	24.2%	48.0%	23.8%	682	84.4%*	27.1%	57.3%	72.9%*	15.5%
1-6	541	65.4%	49.9%	15.5%	50.1%	34.6%	848	74.9%*	32.8%	42.1%	67.2%*	25.1%
7-13	229	61.1%	52.4%	8.7%	47.6%	38.9%	429	73.4%*	40.3%	33.1%	59.7%*	26.6%
14-20	72	61.1%	59.7%	1.4%	40.3%	38.9%	129	77.5%*	52.7%	24.8%	47.3%	22.5%
Provider												
High Volume	921	76.7%	56.4%	20.3%	43.6%	23.3%	1,226	87.9%*	36.1%	51.8%	63.9%*	12.1%
Low Volume	246	63.0%	50.0%	13.0%	50.0%	37.0%	487	70.6%	38.4%	32.2%	61.6%*	29.4%
Community Clinics	158	63.9%	51.3%	12.7%	48.7%	36.1%	246	73.6%*	24.4%	49.2%	75.6%*	26.4%
TPCHO	91	15.4%	9.9%	5.5%	90.1%	84.6%	129	17.9%	10.9%	7.0%	89.1%	82.2%
ICDA												
Infective Diseases and Parasites	66	89.4%	78.8%	10.6%	21.2%	10.6%	89	86.5%	47.2%	39.3%	52.8%*	13.5%
Nutritional Deficiencies, Endocrine and Metabolic Disorders	91	84.6%	69.2%	15.4%	30.8%	15.4%	68	75.0%	29.4%	45.6%	70.5%*	25.0%
Blood Diseases (and blood forming organs)	94	91.5%	50.0%	41.5%	50.0%	8.5%	126	97.7%*	17.5%	80.2%	82.5%*	2.4%
Mental Disorders	74	28.4%	16.2%	12.2%	83.8%	71.6%	106	70.8%*	25.5%	45.3%	74.5%	29.2%
Nervous System and Sense Organs	141	73.0%	33.3%	39.7%	66.7%	27.0%	302	76.8%	27.5%	49.3%	72.5%	23.2%
Circulatory System	20	50.0%	40.0%	10.0%	60.0%	50.0%	34	70.6%	20.6%	50.0%	79.4%	29.4%
Respiratory System	239	96.7%	81.2%	15.5%	18.8%	3.3%	495	96.4%	56.0%	40.4%	44.0%*	3.6%
Digestive System	94	42.6%	29.8%	12.8%	70.2%	57.4%	116	55.2%	25.9%	29.3%	74.1%	44.8%
Genito-Urinary System	27	77.8%	63.0%	14.8%	37.0%	22.2%	73	86.3%	32.9%	53.4%	67.1%*	13.7%
Skin	167	98.2%	78.4%	19.8%	21.6%	1.8%	241	96.3%	43.6%	52.7%	56.4%*	3.7%
Musculoskeletal	37	62.2%	56.8%	5.4%	43.2%	37.8%	31	67.8%	35.5%	32.3%	64.5%	32.3%
Birth Defects	54	44.4%	22.2%	22.2%	77.7%	55.5%	77	59.8%	16.9%	42.9%	83.1%	40.3%
Birth Problems (Perinatal)	22	81.8%	27.3%	54.5%	72.7%	18.2%	30	93.4%	16.7%	76.7%	83.3%	6.7%
Accidents, Poisoning, and Violence	41	85.3%	70.7%	14.6%	29.2%	14.6%	38	71.1%	47.4%	23.7%	52.6%*	28.9%
All Other Conditions	67	47.7%	34.3%	13.4%	65.6%	52,2%	95	74.7%*	18.9%	55.8%	81.1%*	25.3%

---

*Experimental group shows significantly higher proportion than control group.

**Data based on screening sheets.

***Data based on medical referral sheets.

TABLE A-11: TO WHOM REFERRED (CONTROL GROUP ONLY)*

	N	Self	Other
Total	392	64.1%	35.9%
Age			
Under 1	108	88.0%	12.0%
1-6	161	72.3%	27.7%
7-13	95	35.8%	64.2%
14-20	28	21.4%	78.6%
Provider			
High Volume	220	74.8%	25.2%
Low Volume	76	78.9%	21.1%
Community Clinics	32	37.5%	62.5%
TPCHD	64	23.4%	76.6%
ICDA			
Infective Diseases and Parasites	9	55.6%	44.4%
Nutritional Deficiencies, Endocrine and Metabolic Disorders	16	75.0%	25.0%
Blood Diseases (and blood forming organs)	20	95.0%	5.0%
Mental Disorders	49	18.4%	81.6%
Nervous System and Sense Organs	57	57.9%	42.1%
Circulatory System	12	83.3%	16.7%
Respiratory System	17	94.1%	5.9%
Digestive System	47	31.9%	68.1%
Genito-Urinary System	7	71.4%	28.6%
Skin	7	71.4%	28.6%
Musculoskeletal	9	44.4%	55.6%
Birth Defects	19	26.3%	73.7%
Birth Problems (Perinatal)	7	100.0%	0.0%
Accidents, Poisoning, and Violence	9	77.8%	22.2%
Immunizations	77	98.7%	1.3%
All Other Conditions	30	76.7%	23.3%

---

*Table Includes only referred problems and only those where data indicate to whom patient was referred.

TABLE A-12: IMMUNIZATION STATUS, BEFORE AND AFTER SCREEN

	Current at Screen Completion			
	Current Before	Brought Current	Total	Additional Needed
		CONTROL GROUP		
Total	42.6%	48.8%	91.4%	8.6%
Age				
Under 1	37.4%	56.0%	93.4%	6.6%
1-6	42.2%	43.7%	85.9%	14.1%
7-13	54.8%	40.9%	95.7%	4.3%
14-20	60.0%	38.3%	98.3%	1.7%
Provider				
High Volume	43.0%	49.7%	92.7%	7.3%
Low Volume	36.8%	54.5%	91.3%	8.7%
Community Clinics	55.1%	35.3%	90.3%	9.7%
TPCHD	38.7%	49.5%	88.3%	11.7%
		EXPERIMENTAL GROUP		
Total	48.9%	41.7%	90.6%	9.4%
Age				
Under 1	45.4%	46.5%	91.9%	8.1%
1-6	46.5%	40.4%	86.8%	13.2%
7-13	59.3%	34.6%	93.9%	6.1%
14-20	58.7%	40.2%	98.9%	1.1%
Provider				
High Volume	43.2%	50.8%	94.0%	6.0%
Low Volume	54.0%	35.1%	89.1%	10.9%
Community Clinics	61.8%	25.7%	87.5%	12.5%
TPCHD	36.0%	45.6%	81.6%	18.4%

TABLE A-13: DISTRIBUTION OF REFERRED PROBLEMS AND CASES BY VARIOUS CHARACTERISTICS

	Problems				Cases			
	Control		Experimental		Control		Experimental	
Age	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Under 1	109	27.5%	497	35.9%	88	30.4%	308	36.0%
1-6	163	41.1%	570	41.2%	111	38.4%	356	41.5%
7-13	97	24.4%	256	18.5%	68	23.5%	149	17.4%
14-20	28	7.1%	61	4.4%	22	7.6%	42	4.9%
	397	100.0%	1,384	100.0%	289	100.0%	855	100.0%
Provider								
High Volume	224	56.4%	783	56.5%	154	53.3%	443	51.8%
Low Volume	76	19.1%	300	21.7%	62	21.5%	205	24.0%
Community Clinics	33	8.3%	186	13.4%	29	10.0%	135	15.8%
TPCHD	64	16.1%	115	8.3%	44	15.2%	72	8.4%
	397	100.0%	1,384	100.0%	289	100.0%	855	100.0%
Screen Month								
June 1977	154		-		115		-	
July 1977	149		1		104		1	
August 1977	88		45		65		33	
September 1977	6		167		5		112	
October 1977	-		188		-		116	
November 1977	-		190		-		119	
December 1977	-		117		-		73	
January 1978	-		211		-		124	
February 1978	-		156		-		98	
March 1978	-		166		-		88	
April 1978	-		127		-		80	
May 1978	-		14		-		10	
Unknown	-		2		-		1	
	397		1,384		289		855	
CHW								
1	-	-	489	35.3%	-	-	298	34.9%
2	-	-	226	16.3%	-	-	130	15.2%
3	-	-	459	33.1%	-	-	297	34.7%
4	-	-	210	15.2%	-	-	130	15.2%
			1,384	100.0%			355	100.0%
Residence								
Tacoma (98401-98499)	-	-	-	-	229	79.2%	642	75.1%
Puyallup (98371)	-	-	-	-	17	5.9%	94	11.0%
Sumner (98390)	-	-	-	-	9	3.1%	35	4.1%
Spanaway (98387)	-	-	-	-	13	4.5%	23	2.7%
Other	-	-	-	-	21	7.3%	61	7.1%
					239	100.0%	855	100.0%
ICDA								
Infective Diseases & Parasites	9	2.3%	47	3.4%				
Nutritional Deficiencies, Endocrine and Metabolic Disorders	16	4.0%	48	3.5%				
Blood Diseases (and blood forming organs)	20	5.0%	104	7.5%				
Mental Disorders	49	12.3%	79	5.7%				
Nervous Syst. and Sense Organs	57	14.4%	219	15.8%				
Circulatory System	12	3.0%	27	2.0%				
Respiratory System	17	4.3%	218	15.8%				
Digestive System	47	11.8%	86	6.2%				
Genito-Urinary System	7	1.8%	49	3.5%				
Skin	7	1.8%	136	9.8%				
Musculo-Skeletal	9	2.3%	20	1.4%				
Birth Defects	20	5.0%	64	4.6%				
Birth Problems (Perinatal)	7	1.8%	25	1.8%				
Accidents, Poisoning and Violence	9	2.3%	20	1.4%				
Immunizations	78	19.6%	165	11.9%				
All Other Conditions	33	8.3%	77	5.6%				
	397	100.0%	1,384	100.0%				

CMS LIBRARY
3 8095 00014770 8